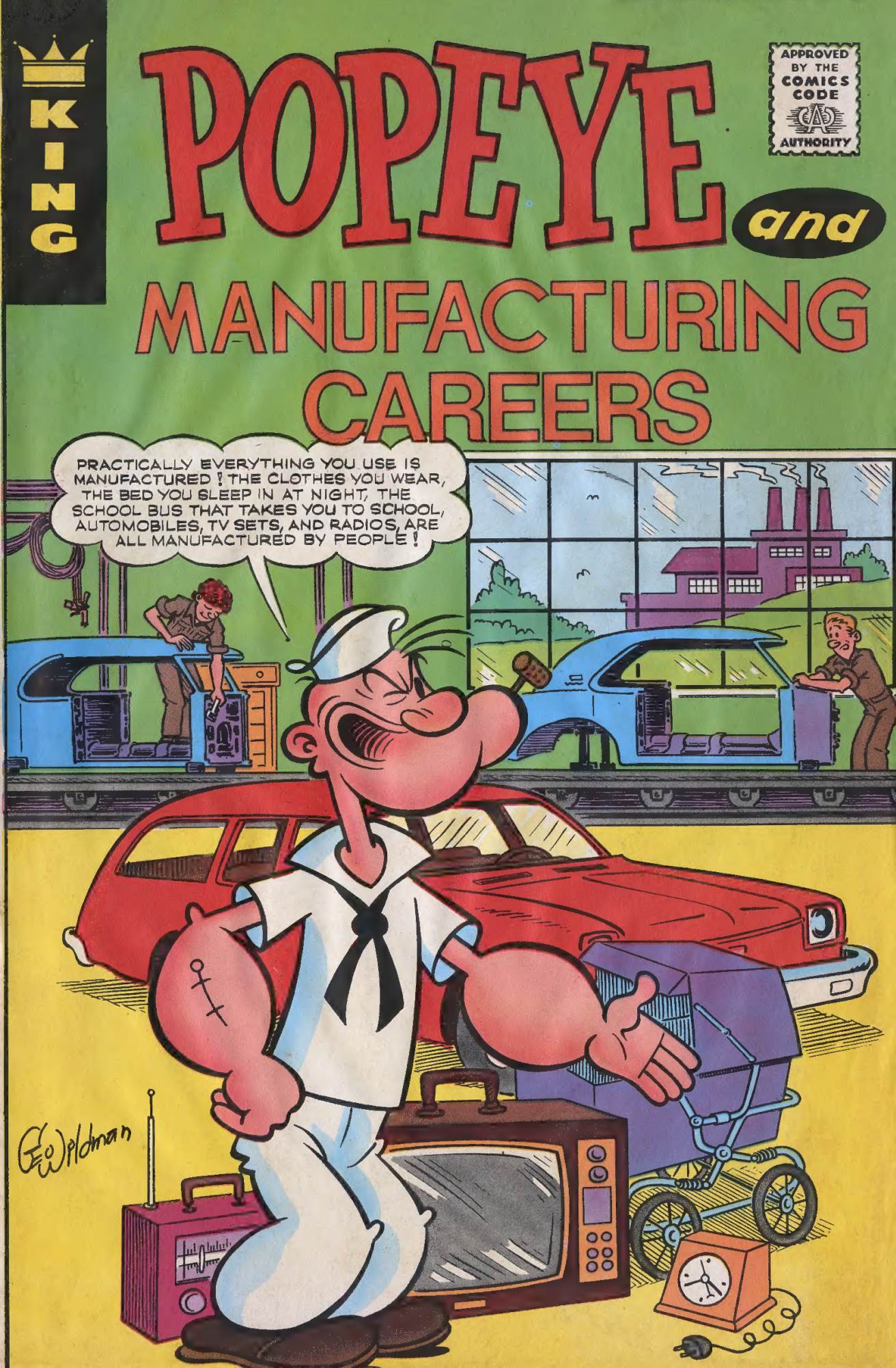
KING

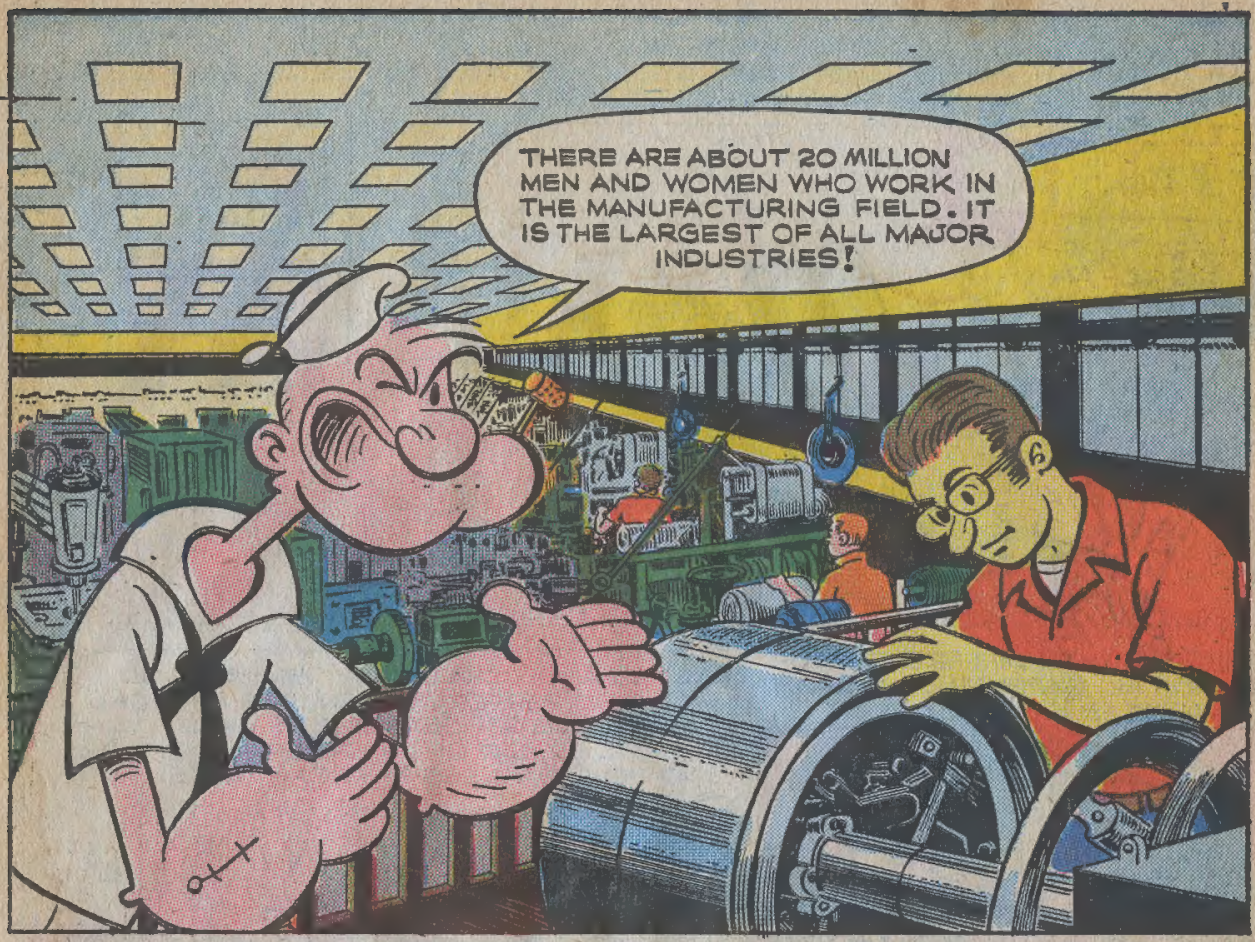
POPEYE and MANUFACTURING CAREERS

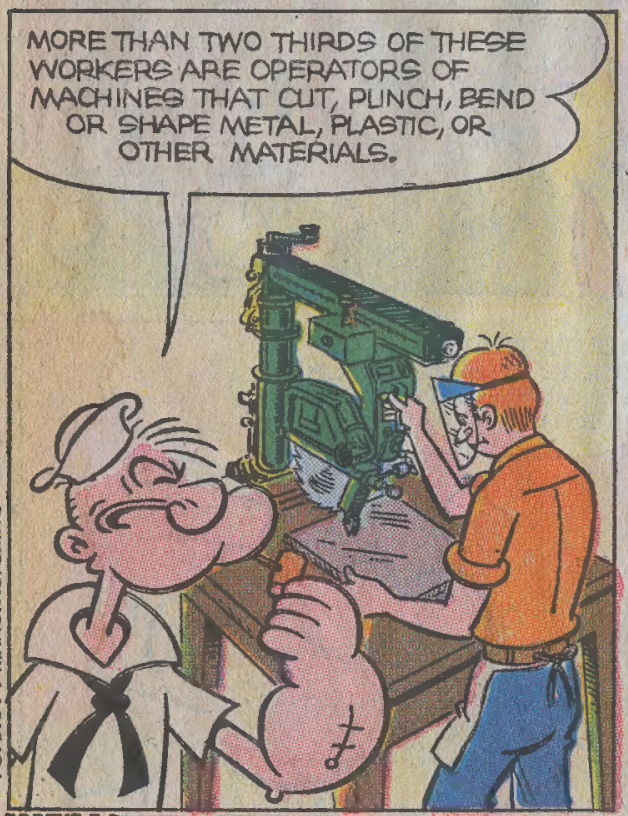
APPROVED BY THE COMICS CODE AUTHORITY

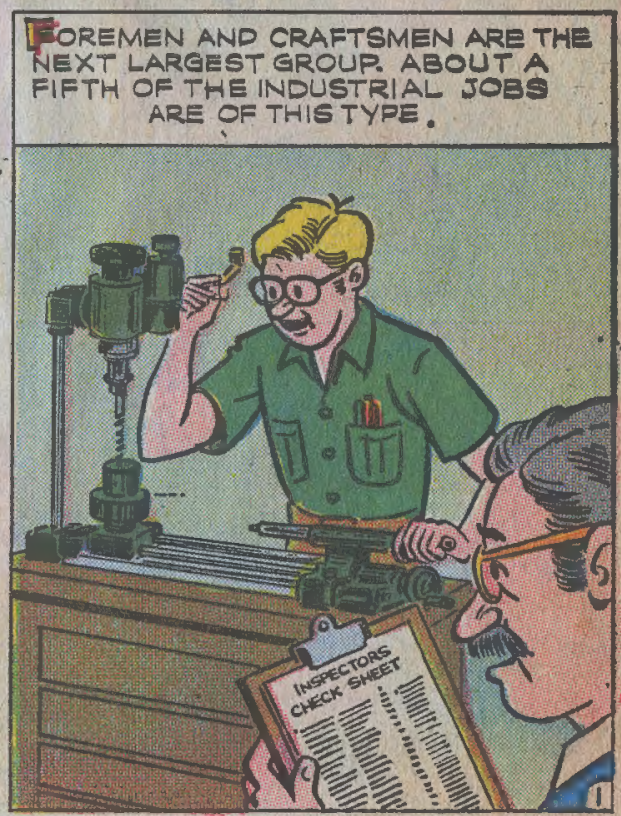

PRACTICALLY EVERYTHING YOU USE IS MANUFACTURED ! THE CLOTHES YOU WEAR, THE BED YOU SLEEP IN AT NIGHT, THE SCHOOL BUS THAT TAKES YOU TO SCHOOL, AUTOMOBILES, TV SETS, AND RADIOS, ARE ALL MANUFACTURED BY PEOPLE !
E.C. Segar

WRITER: JOE GILL

ARTIST: PAUL FUNG




MORE THAN TWO THIRDS OF THESE WORKERS ARE OPERATORS OF MACHINES THAT CUT, PUNCH, BEND OR SHAPE METAL, PLASTIC, OR OTHER MATERIALS.


FOREMEN AND CRAFTSMEN ARE THE NEXT LARGEST GROUP. ABOUT A FIFTH OF THE INDUSTRIAL JOBS ARE OF THIS TYPE.
INSPECTORS CHECK SHEET

POPEYE E-7 MANUFACTURING

POPEYE E-7
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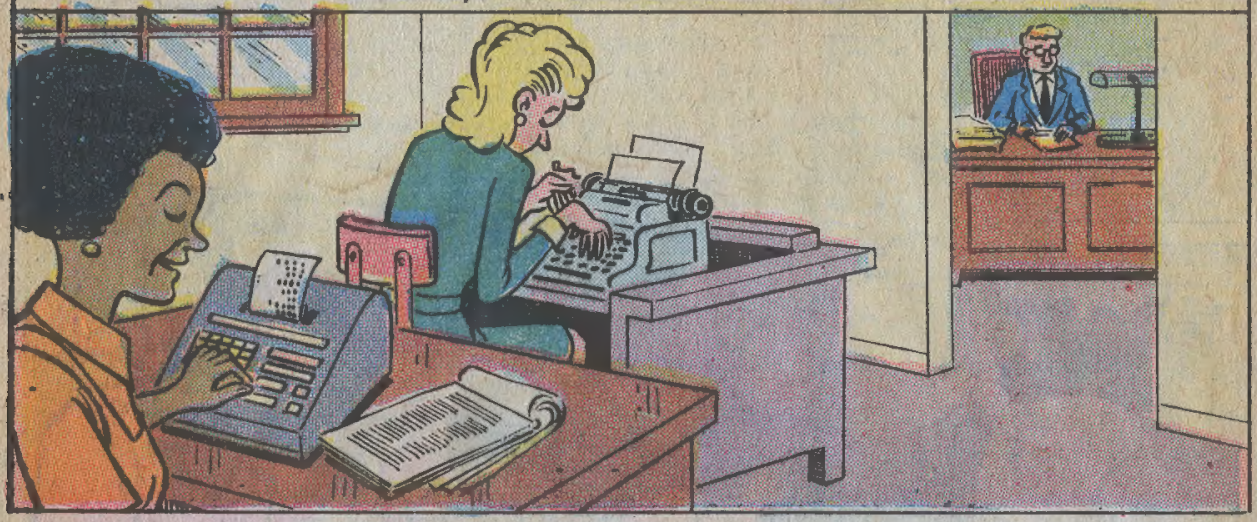
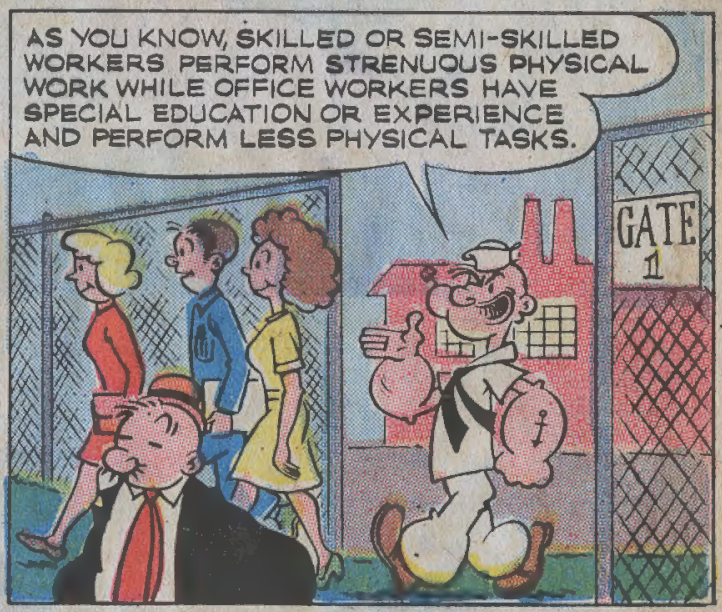
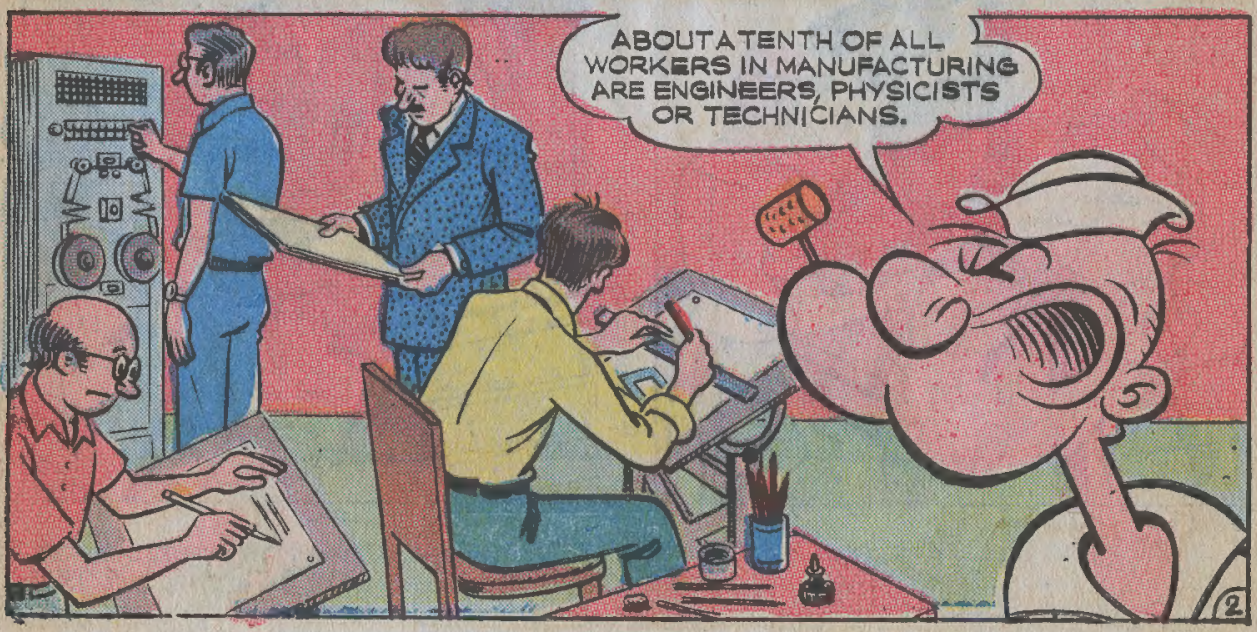
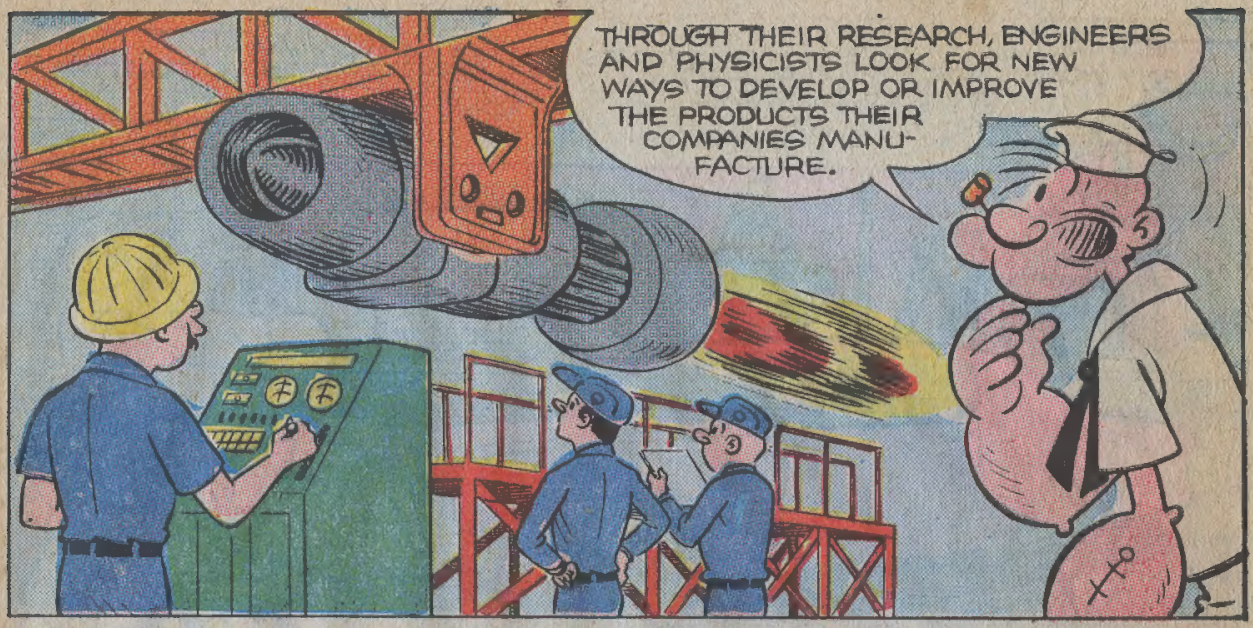
THE THIRD LARGEST GROUP OF PEOPLE IN MANUFACTURING WORK IN OFFICES. MANY WOMEN ARE EMPLOYED DOING THE BOOKKEEPING, MAKING OUT PAYROLLS, TYPING REPORTS, AND OTHER OFFICE WORK.

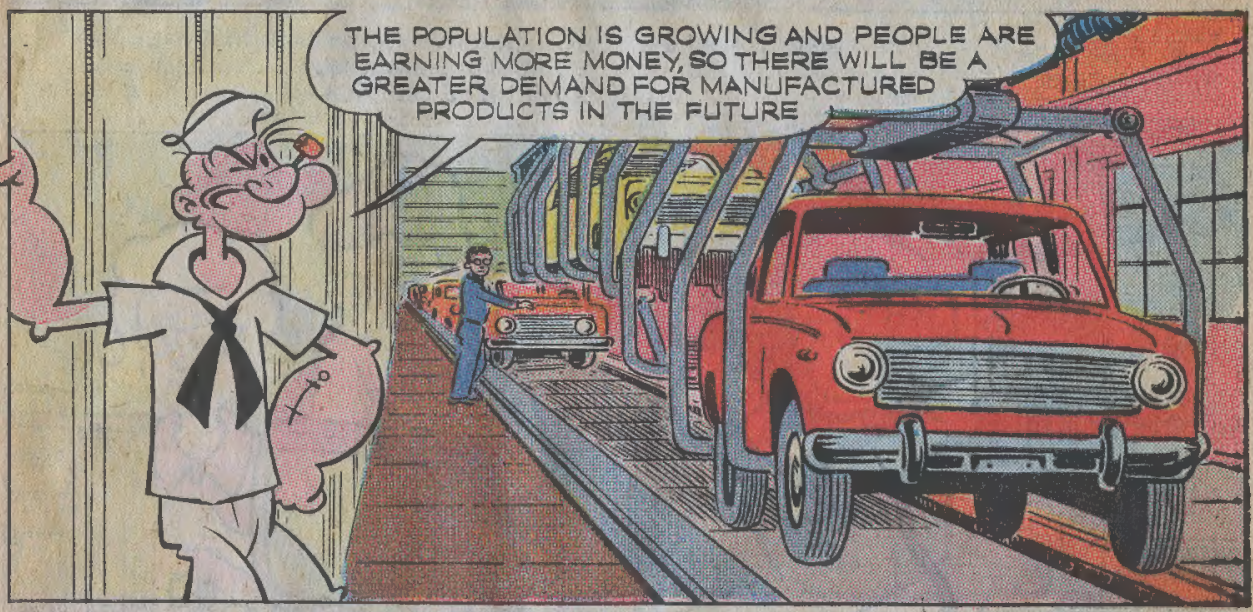


PERSONS WITH DIFFERENT EDUCATIONAL EXPERIENCE WORK IN OFFICES.

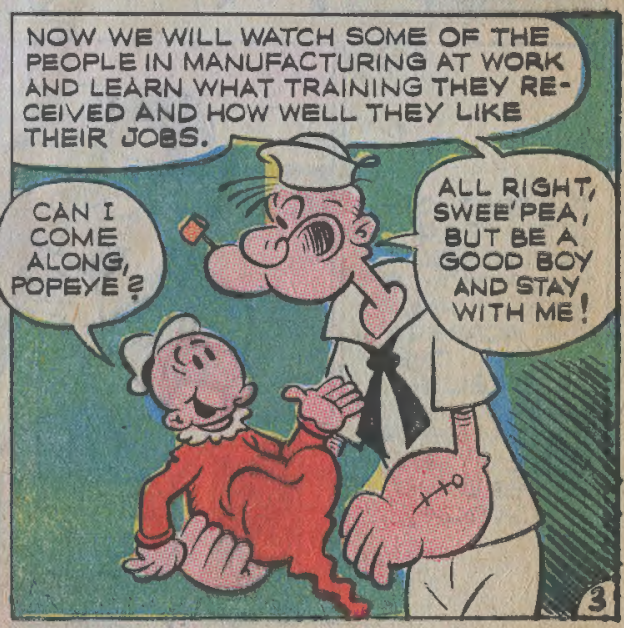

AS YOU KNOW, SKILLED OR SEMI-SKILLED WORKERS PERFORM STRENUOUS PHYSICAL WORK WHILE OFFICE WORKERS HAVE SPECIAL EDUCATION OR EXPERIENCE AND PERFORM LESS PHYSICAL TASKS.
GATE 1

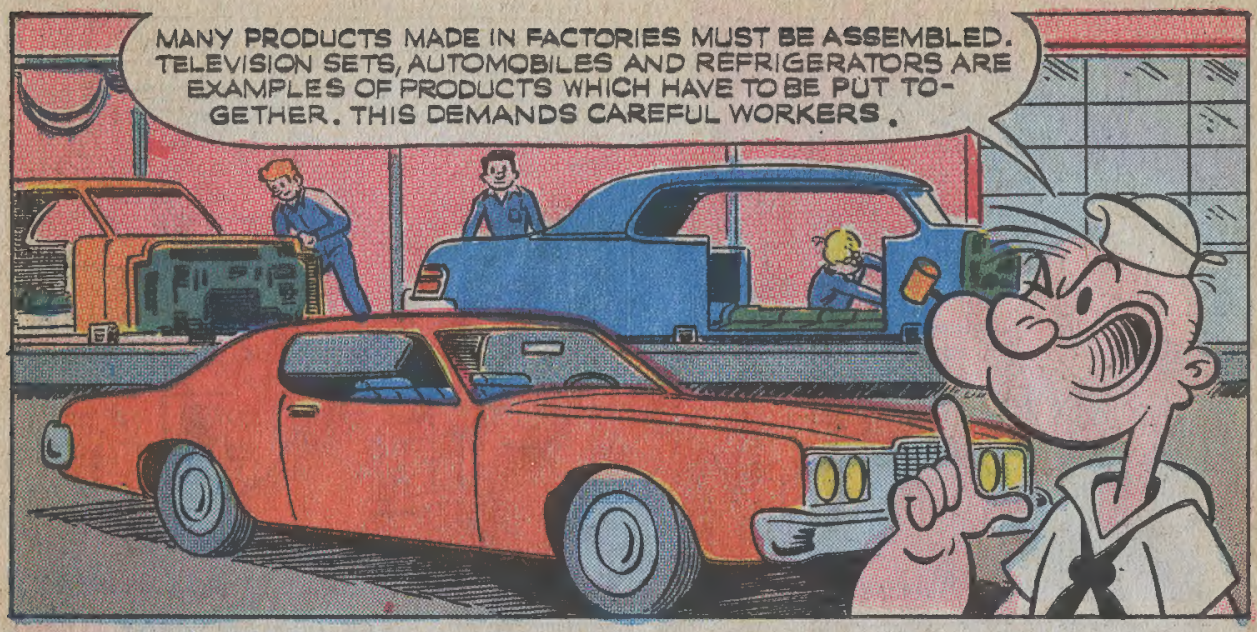



THROUGH THEIR RESEARCH, ENGINEERS AND PHYSICISTS LOOK FOR NEW WAYS TO DEVELOP OR IMPROVE THE PRODUCTS THEIR COMPANIES MANUFACTURE.

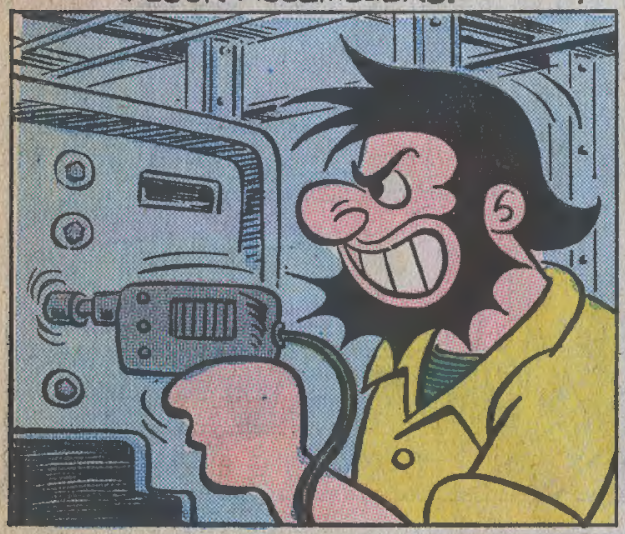

THE POPULATION IS GROWING AND PEOPLE ARE EARNING MORE MONEY, SO THERE WILL BE A GREATER DEMAND FOR MANUFACTURED PRODUCTS IN THE FUTURE

WORKERS WILL MAKE MORE THINGS IN A SHORTER TIME. THEY WILL EARN MORE AND HAVE MORE TIME OFF!

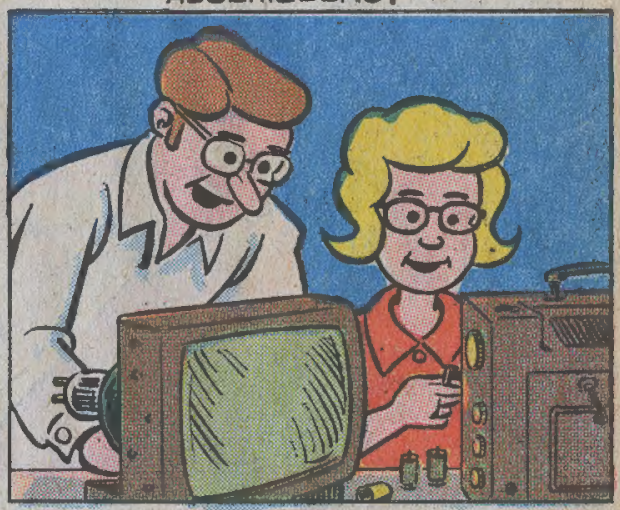

NOW WE WILL WATCH SOME OF THE PEOPLE IN MANUFACTURING AT WORK AND LEARN WHAT TRAINING THEY RECEIVED AND HOW WELL THEY LIKE THEIR JOBS.
CAN I COME ALONG, POPEYE?
ALL RIGHT, SWEE'PEA, BUT BE A GOOD BOY AND STAY WITH ME!


MANY PRODUCTS MADE IN FACTORIES MUST BE ASSEMBLED. TELEVISION SETS, AUTOMOBILES AND REFRIGERATORS ARE EXAMPLES OF PRODUCTS WHICH HAVE TO BE PUT TOGETHER. THIS DEMANDS CAREFUL WORKERS.

WORKERS WHO PUT TOGETHER LARGE, HEAVY EQUIPMENT ARE KNOWN AS FLOOR ASSEMBLERS.



WORKERS WHO ASSEMBLE SMALL PARTS TO MAKE SMALL SUB-ASSEMBLES OR COMPLETE UNITS ARE CALLED BENCH ASSEMBLERS!



THE PRODUCTS OFTEN ARE ON A MOVING BELT WHICH MOVES SLOWLY PAST THE WORKER'S STATION. THE ASSEMBLER MUST COMPLETE HIS JOB BEFORE THE UNIT HAS PASSED HIS STATION.

THE WORK IS NOT USUALLY STRENUOUS, BUT THE ASSEMBLER MUST KEEP DOING THE SAME THING OVER AND OVER AGAIN. BOTH MEN AND WOMEN WORK AS ASSEMBLERS.
SOME ASSEMBLERS PERFORM VERY SIMPLE TASKS SUCH AS STARTING TO TIGHTEN NUTS AND BOLTS, LEAVING FINAL TIGHTENING TO OTHER ASSEMBLERS. THESE WORKERS REQUIRE VERY LITTLE ON-THE-JOB TRAINING.
SKILLED WORKERS ASSEMBLE THE FINAL PRODUCTS, WHICH MAY BE MACHINERY OR EQUIPMENT OF MANY PARTS. THEY MUST KNOW HOW TO READ BLUEPRINTS AND OTHER ENGINEERING PLANS AND MEASUREMENTS.
ASSEMBLERS WORK IN PLANTS THAT MASS-PRODUCE PRODUCTS SUCH AS AUTOMOBILES, AIRCRAFT, REFRIGERATORS, CAMERAS AND ELECTRIC MOTORS. NEARLY 800,000 ASSEMBLERS WORK IN MANUFACTURING PLANTS.
ABOUT HALF OF ALL ASSEMBLERS ARE WOMEN WHO WORK AS BENCH ASSEMBLERS. MEN USUALLY ARE HIRED FOR THE MORE STRENUOUS JOBS AS FLOOR ASSEMBLERS.
5

ASSEMBLY LINE WORKERS USUALLY CAN LEARN THEIR JOBS IN A FEW DAYS OR WEEKS. A FOREMAN OR AN EXPERIENCED ASSEMBLER WILL SUPERVISE THE NEW MEN'S WORK.
WE NEED ASSEMBLERS WHO ARE PHYSICALLY FIT, DEPENDABLE AND HAVE SOME ABILITY TO DO MECHANICAL WORK.
HIGH SCHOOL GRADUATES OR PEOPLE WHO HAVE TAKEN VOCATIONAL SCHOOL COURSES ARE PREFERRED BY EMPLOYERS, ALTHOUGH A HIGH-SCHOOL DIPLOMA IS NOT ALWAYS NECESSARY.
BLUEPRINT OF SECTION A-B PARTS THREE & FOUR
SKILLED, HARD WORKING ASSEMBLERS MAY BE PROMOTED TO INSPECTOR OR FOREMAN!
GOSH!

ALMOST EVERYTHING THAT'S MANUFACTURED, MUST BE CAREFULLY INSPECTED. ALL THE AUTOMOBILES, SEWING MACHINES, AND OTHER EQUIPMENT MUST BE TESTED TO MAKE SURE THAT EVERYTHING IS IN GOOD WORKING CONDITION.

INSPECTOR

SOME INSPECTORS EXAMINE FINISHED PRODUCTS ONLY TO CHECK FOR SCRATCHES AND SUCH; OTHERS USE VARIOUS MEASURING INSTRUMENTS TO CHECK THE PRODUCT.

INSPECTOR

THERE ARE NEARLY 600,000 INSPECTORS EMPLOYED IN THE MANUFACTURING FIELD.

ELECTRONIC ENGINE Tester

MANY INSPECTORS ARE WOMEN. THEY INSPECT PRODUCTS IN THE FOOD, TEXTILE, CLOTHING AND OTHER INDUSTRIES.

SKILLED INSPECTORS USE A WIDE VARIETY OF TEST INSTRUMENTS, WORKING WITH LITTLE SUPERVISION. SEMISKILLED INSPECTORS USUALLY WORK UNDER CLOSE SUPERVISION.

ELECTRONIC PART TESTER

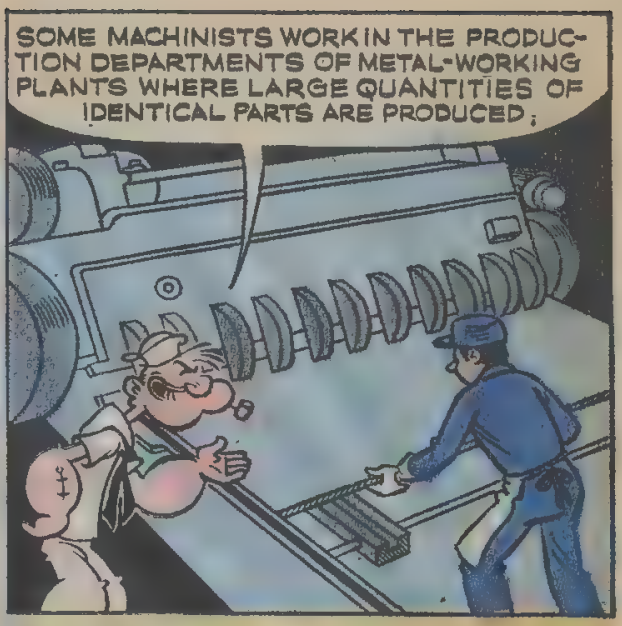
INSPECTORS LIKE THIS YOUNG GIRL IN A FOOD PROCESSING PLANT GET ON-THE-JOB TRAINING FOR A FEW HOURS OR A FEW WEEKS, DEPENDING ON THE SKILLS NEEDED.

MOST EMPLOYERS LOOK FOR INSPECTORS WHO HAVE GOOD HEALTH AND EYESIGHT AND WHO CAN DO THE JOB WELL. SOME EMPLOYERS WOULD RATHER HAVE EXPERIENCED PRODUCTION WORKERS AS INSPECTORS.

THOSE INTERESTED IN INSPECTOR'S JOBS NEED NOT BE HIGH SCHOOL GRADUATES IF THEY HAVE ABILITY, INTEREST AND SOME OTHER WORK EXPERIENCE THAT WILL BE OF HELP.

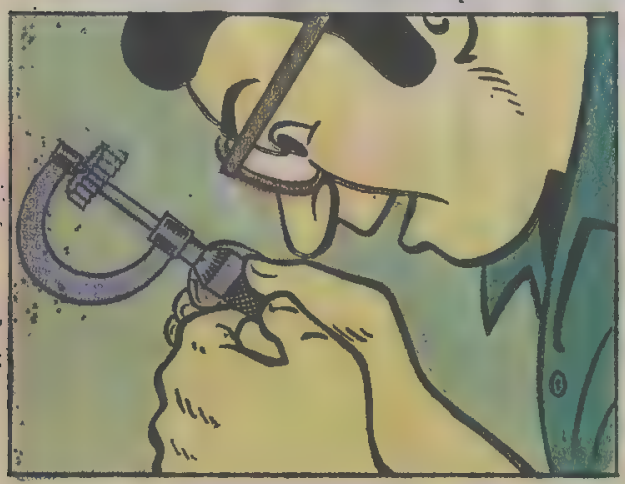
INSPECTOR JOBS ARE CLASSIFIED AT A, B, OR C, LEVELS, DEPENDING ON HOW MUCH SKILL AND RESPONSIBILITY ARE INVOLVED.

ALMOST EVERY FACTORY USING A LOT OF MACHINERY HAS ALL-AROUND MACHINISTS TO KEEP THE EQUIPMENT WORKING. THIS MACHINIST IS OPERATING A LARGE METAL SHAPING LATHE.

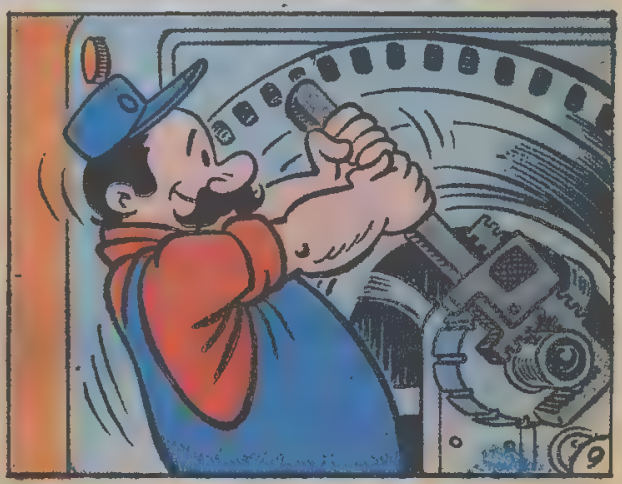

SOME MACHINISTS WORK IN THE PRODUCTION DEPARTMENTS OF METAL-WORKING PLANTS WHERE LARGE QUANTITIES OF IDENTICAL PARTS ARE PRODUCED.

AN ALL-AROUND MACHINIST MUST READ BLUEPRINTS AND SELECT THE TOOLS AND METHODS REQUIRED TO COMPLETE THE JOB.

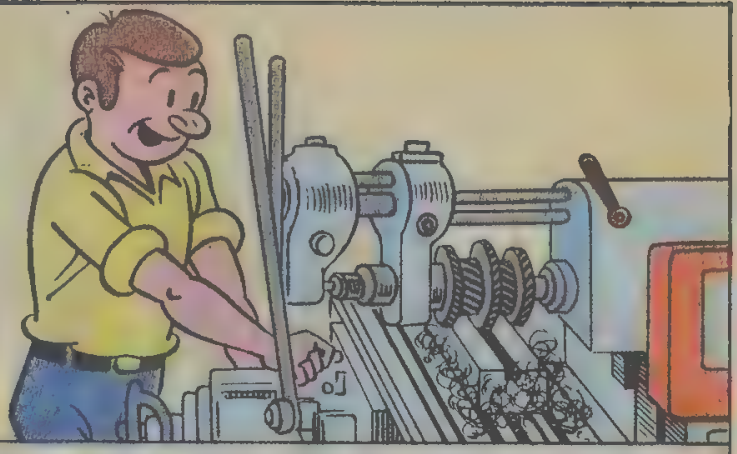
THIS SKILLED MACHINIST USES HIGHLY ACCURATE MEASURING TOOLS TO MAKE SURE HIS WORK IS WITHIN THOUSANDTHS OF AN INCH EXACT.



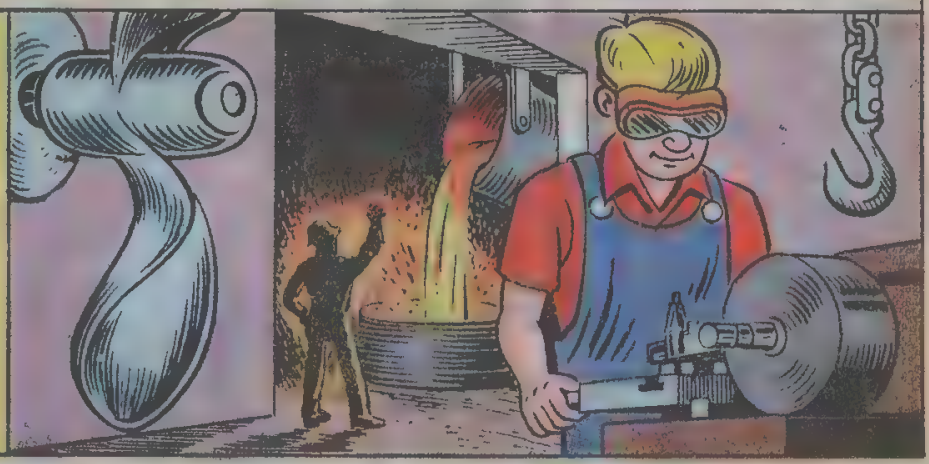
MACHINISTS SHOULD KNOW MECHANICAL LAWS SO THAT THEY CAN TAKE MACHINES APART, ADJUST THEM AND REASSEMBLE THEM IN GOOD WORKING ORDER.



A GENERAL MACHINIST CAN LAY OUT THE WORK AND SET UP AND OPERATE SEVERAL KINDS OF MACHINE TOOLS. THESE MACHINISTS PERFORM DIFFICULT OPERATIONS AND THEY USUALLY WORK IN EXPERIMENTAL AND PROTOTYPE PRODUCTION. PROTOTYPES ARE THE FIRST MODELS OF WHAT IS TO BE MADE OR PRODUCED.



SOME METALWORKING FACTORIES, SUCH AS ENGINE AND PROPELLER PLANTS, EMPLOY MORE GENERAL MACHINISTS THAN OTHERS.



MOST MACHINISTS SERVE A FOUR YEAR APPRENTICESHIP. SOME BECOME MACHINISTS THROUGH YEARS OF VARIED EXPERIENCE IN DIFFERENT JOBS.

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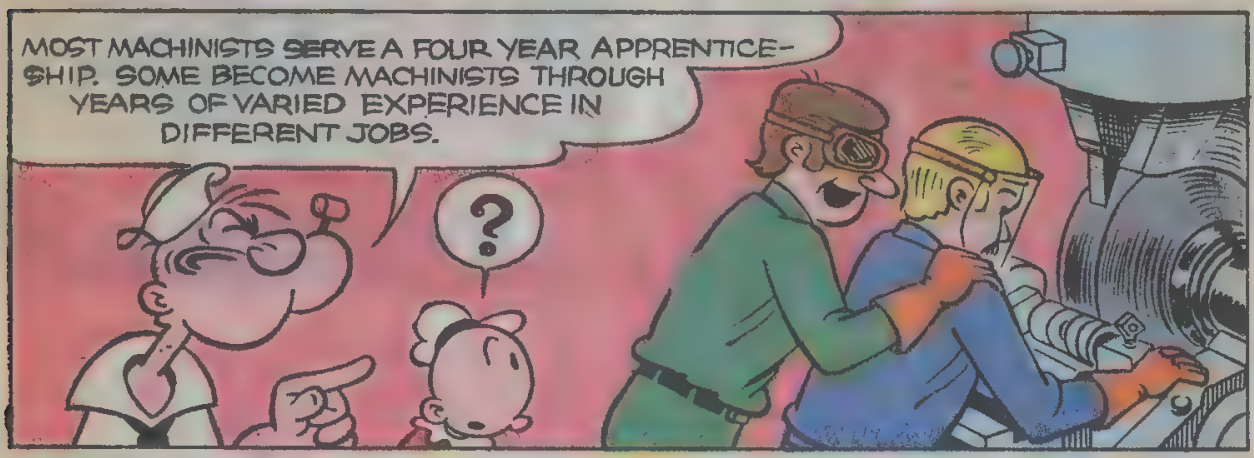
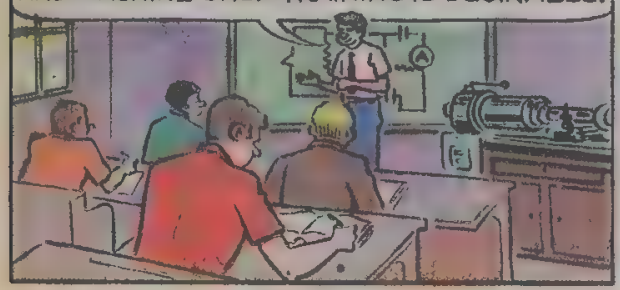
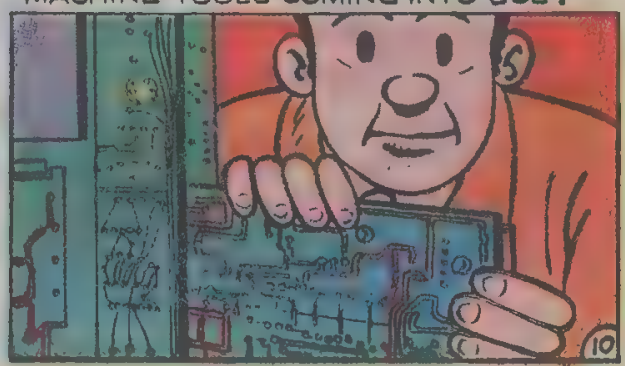


STUDENTS INTERESTED IN A MACHINIST'S CAREER SHOULD BE MECHANICALLY INCLINED AND ABLE TO DO VERY ACCURATE WORK. A VOCATIONAL SCHOOL EDUCATION THAT INCLUDES MATHEMATICS, PHYSICS AND MACHINE SHOP TRAINING IS DESIRABLE.



SOME COMPANIES TRAIN THEIR EXPERIENCED MACHINISTS TO USE NEW MACHINE TOOLS COMING INTO USE.



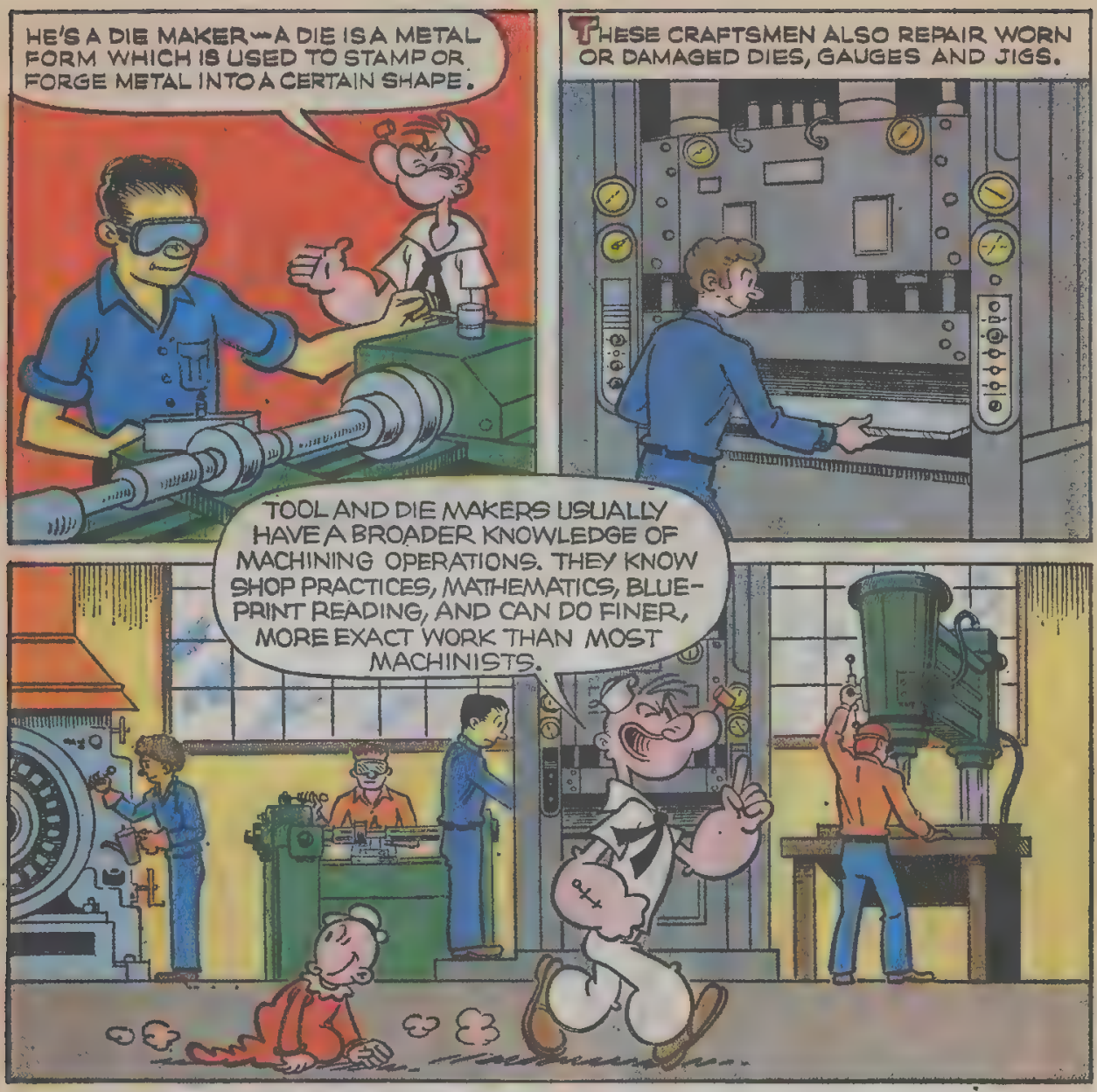
MACHINE EQUIPMENT BUILDERS USUALLY PROVIDE TRAINING IN THE OPERATIONAL AND CONTROL SYSTEMS ON NEW MACHINES.

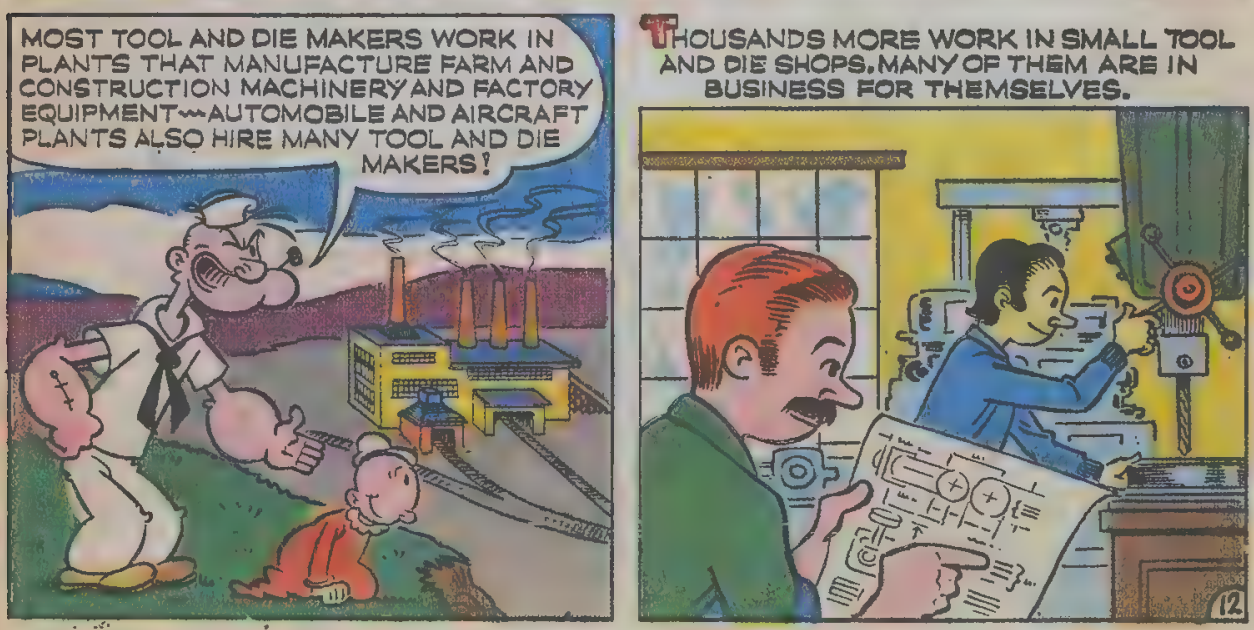
AN APPRENTICE PROGRAM OFTEN LASTS 4 YEARS OR ABOUT 8,000 HOURS OF MACHINE SHOP TRAINING, WITH ANOTHER 570 HOURS OF CLASSROOM INSTRUCTION.

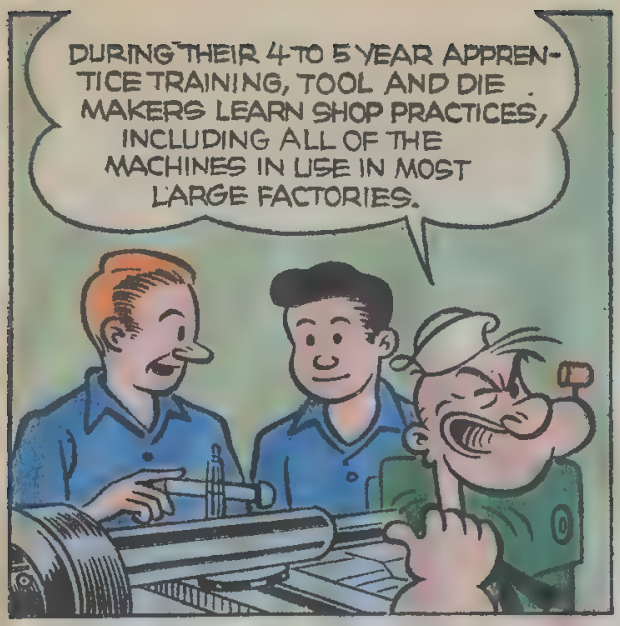
MANY MACHINISTS ADVANCE TO SECTION FOREMAN OR THEY MAY BECOME TOOL AND DIE MAKERS OR INSTRUMENT MAKERS.

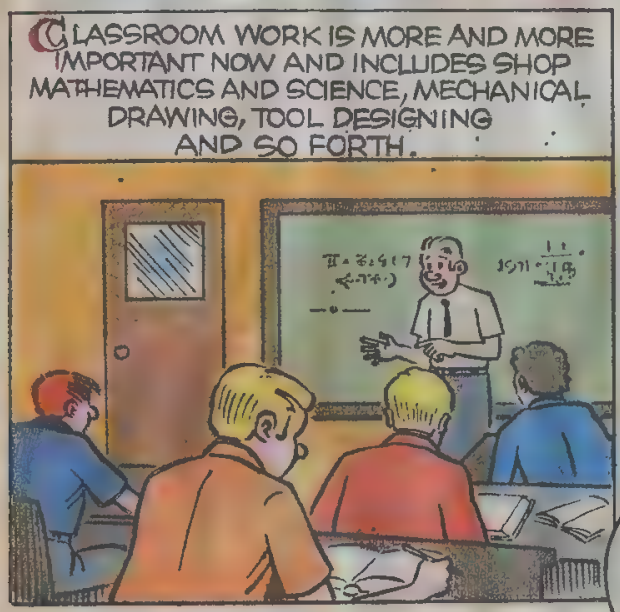
THIS MAN IS A TOOL AND DIE MAKER. HE MAKES TOOLS AND DIES AND SPECIAL JIGS OR HOLDING PARTS THAT ARE NEEDED IN THE MACHINES USED TO MAKE THE PRODUCTS IN THE METALWORKING INDUSTRIES.

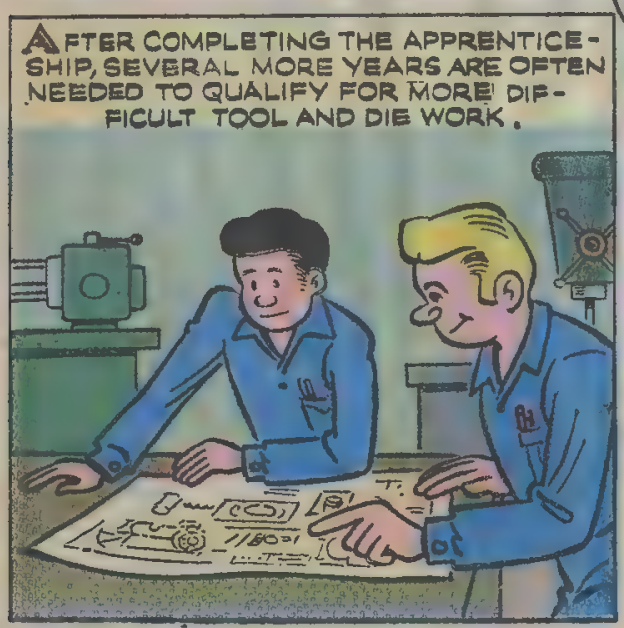
TOOL MAKERS SPECIALIZE IN JIGS AND FIXTURES WHICH HOLD METAL PARTS WHILE THEY ARE SHAVED, STAMPED OR DRILLED. THEY ALSO MAKE DIFFERENT KINDS OF MEASURING INSTRUMENTS.


HE'S A DIE MAKER—A DIE IS A METAL FORM WHICH IS USED TO STAMP OR FORGE METAL INTO A CERTAIN SHAPE.
THESE CRAFTSMEN ALSO REPAIR WORN OR DAMAGED DIES, GAUGES AND JIGS.
TOOL AND DIE MAKERS USUALLY HAVE A BROADER KNOWLEDGE OF MACHINING OPERATIONS. THEY KNOW SHOP PRACTICES, MATHEMATICS, BLUE-PRINT READING, AND CAN DO FINER, MORE EXACT WORK THAN MOST MACHINISTS.

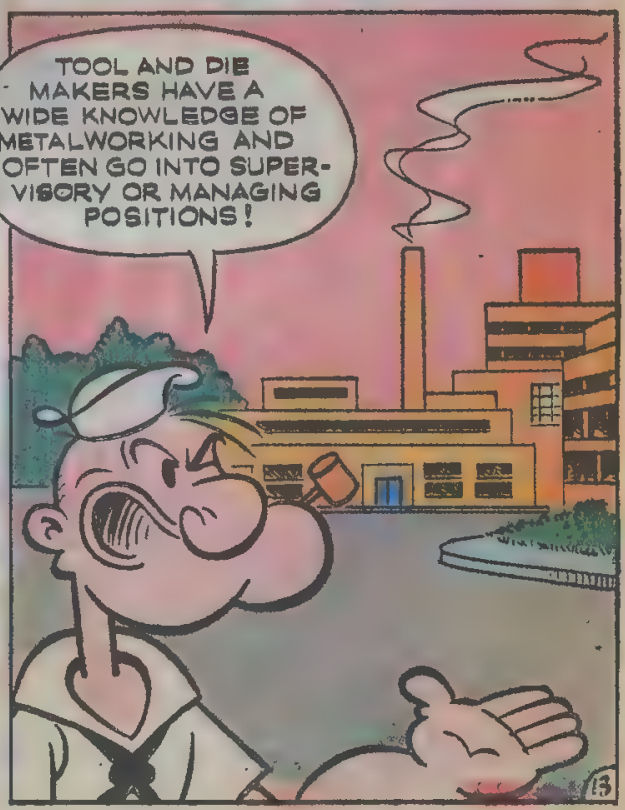

MOST TOOL AND DIE MAKERS WORK IN PLANTS THAT MANUFACTURE FARM AND CONSTRUCTION MACHINERY AND FACTORY EQUIPMENT—AUTOMOBILE AND AIRCRAFT PLANTS ALSO HIRE MANY TOOL AND DIE MAKERS!
THOUSANDS MORE WORK IN SMALL TOOL AND DIE SHOPS. MANY OF THEM ARE IN BUSINESS FOR THEMSELVES.
12

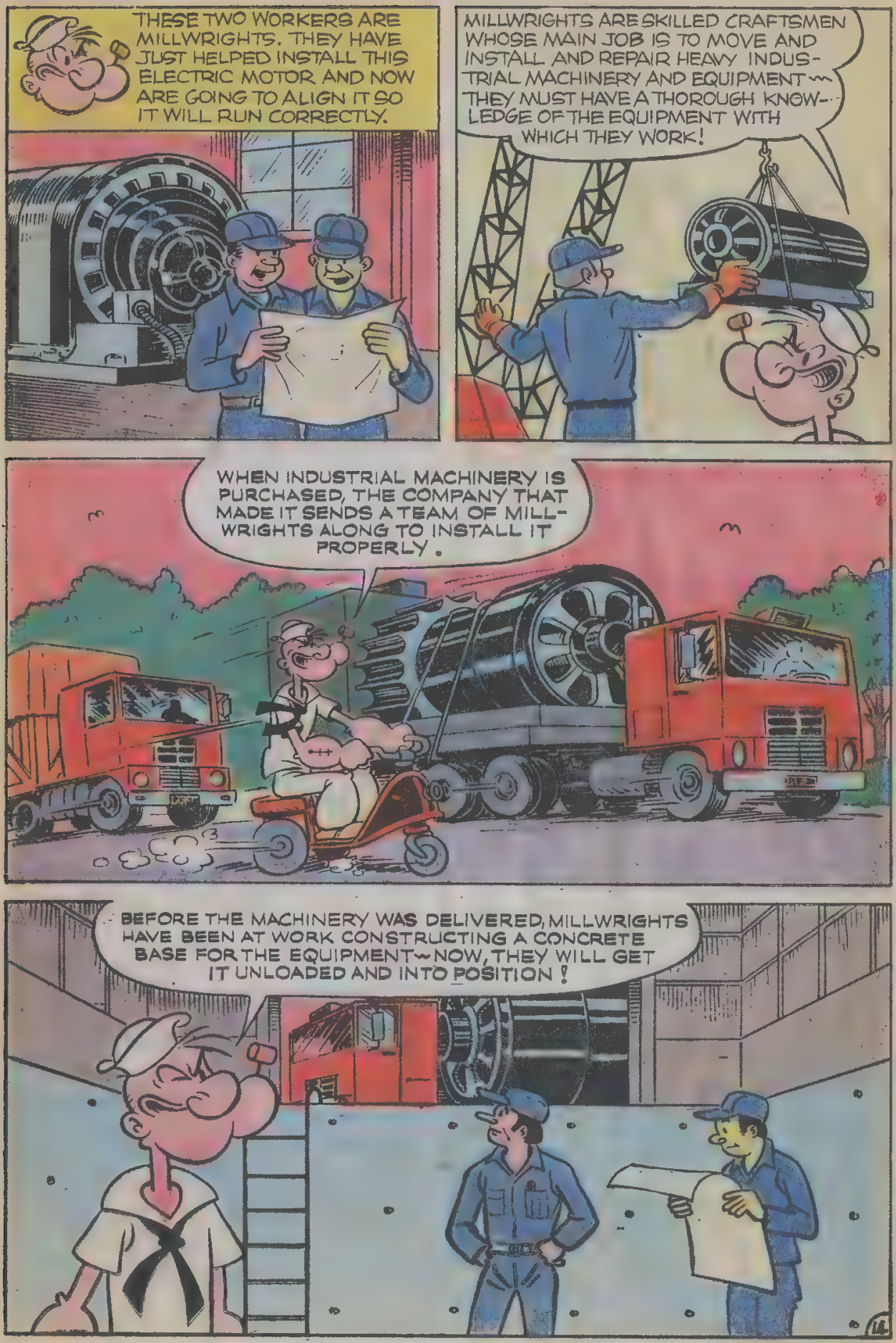

DURING THEIR 4 TO 5 YEAR APPRENTICE TRAINING, TOOL AND DIE MAKERS LEARN SHOP PRACTICES, INCLUDING ALL OF THE MACHINES IN USE IN MOST LARGE FACTORIES.

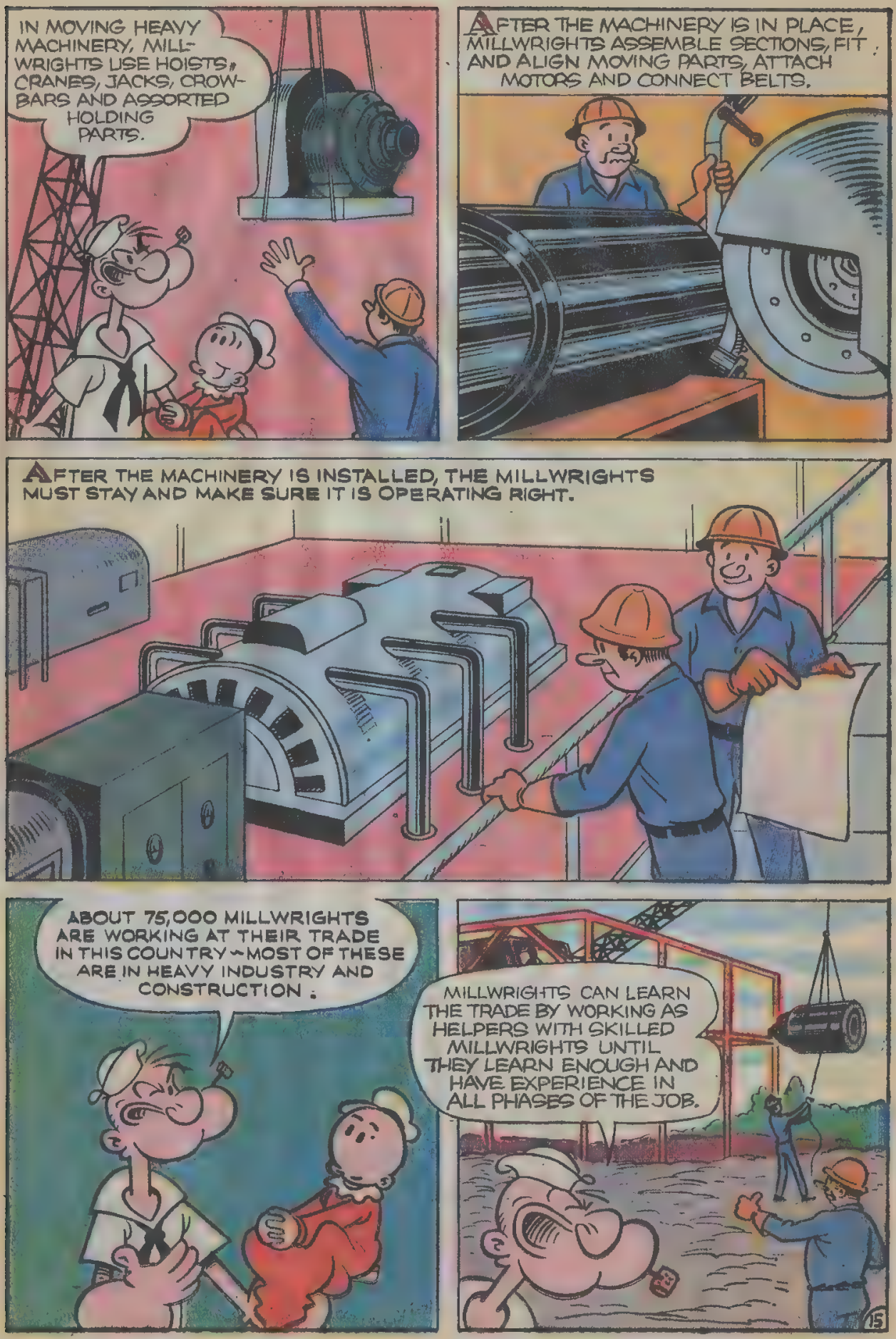

CLASSROOM WORK IS MORE AND MORE IMPORTANT NOW AND INCLUDES SHOP MATHEMATICS AND SCIENCE, MECHANICAL DRAWING, TOOL DESIGNING AND SO FORTH.


AFTER COMPLETING THE APPRENTICESHIP, SEVERAL MORE YEARS ARE OFTEN NEEDED TO QUALIFY FOR MORE DIFFICULT TOOL AND DIE WORK.

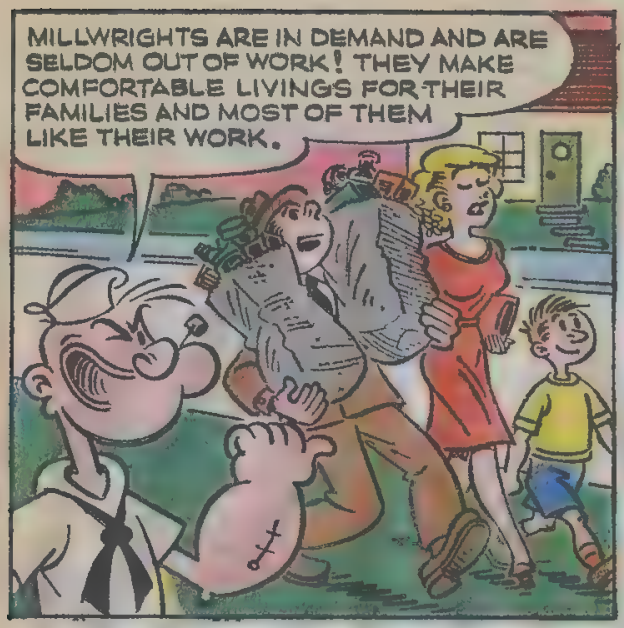
A TOOL AND DIE MAKER ALSO LEARNS INSPECTION WORK. HE MUST BE ABLE TO USE HAND TOOLS, TO ASSEMBLE TOOLS AND GAUGES. HE HAS TO STUDY HEAT TREATING AND OTHER METALWORKING PROCESSES!

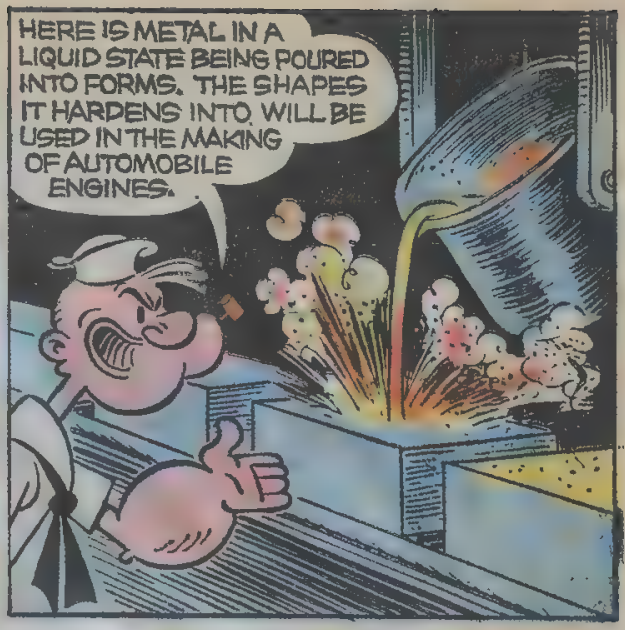

TOOL AND DIE MAKERS HAVE A WIDE KNOWLEDGE OF METALWORKING AND OFTEN GO INTO SUPERVISORY OR MANAGING POSITIONS!
13


THESE TWO WORKERS ARE MILLWRIGHTS. THEY HAVE JUST HELPED INSTALL THIS ELECTRIC MOTOR AND NOW ARE GOING TO ALIGN IT SO IT WILL RUN CORRECTLY.
MILLWRIGHTS ARE SKILLED CRAFTSMEN WHOSE MAIN JOB IS TO MOVE AND INSTALL AND REPAIR HEAVY INDUSTRIAL MACHINERY AND EQUIPMENT ~ THEY MUST HAVE A THOROUGH KNOWLEDGE OF THE EQUIPMENT WITH WHICH THEY WORK!
WHEN INDUSTRIAL MACHINERY IS PURCHASED, THE COMPANY THAT MADE IT SENDS A TEAM OF MILLWRIGHTS ALONG TO INSTALL IT PROPERLY.
BEFORE THE MACHINERY WAS DELIVERED, MILLWRIGHTS HAVE BEEN AT WORK CONSTRUCTING A CONCRETE BASE FOR THE EQUIPMENT ~ NOW, THEY WILL GET IT UNLOADED AND INTO POSITION!
14

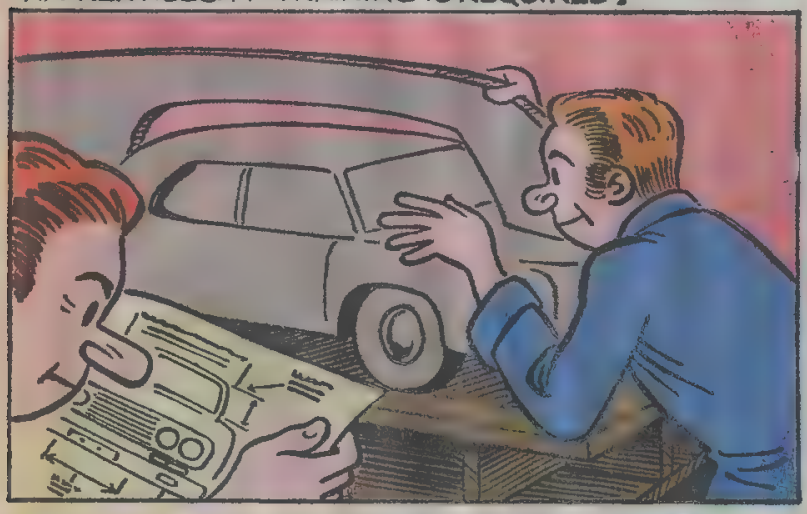

IN MOVING HEAVY MACHINERY, MILLWRIGHTS USE HOISTS, CRANES, JACKS, CROWBARS AND ASSORTED HOLDING PARTS.
AFTER THE MACHINERY IS IN PLACE, MILLWRIGHTS ASSEMBLE SECTIONS, FIT AND ALIGN MOVING PARTS, ATTACH MOTORS AND CONNECT BELTS.
AFTER THE MACHINERY IS INSTALLED, THE MILLWRIGHTS MUST STAY AND MAKE SURE IT IS OPERATING RIGHT.
ABOUT 75,000 MILLWRIGHTS ARE WORKING AT THEIR TRADE IN THIS COUNTRY—MOST OF THESE ARE IN HEAVY INDUSTRY AND CONSTRUCTION.
MILLWRIGHTS CAN LEARN THE TRADE BY WORKING AS HELPERS WITH SKILLED MILLWRIGHTS UNTIL THEY LEARN ENOUGH AND HAVE EXPERIENCE IN ALL PHASES OF THE JOB.
15

EXPERTS SAY THAT BEGINNERS NEED FOUR YEARS OF APPRENTICE TRAINING TO BECOME GOOD MILLWRIGHTS. APPRENTICES GET SHOP TRAINING IN TAKING APART, MOVING, SETTING UP AND REPAIRING EQUIPMENT.
MILLWRIGHTS MUST KNOW ALL THE SKILLS OF CUTTING, JOINING, AND SHAPING OF WOOD AND SHEET METAL.
APPRENTICE MILLWRIGHTS LEARN SHOP MATH, BLUEPRINT READING, ENGINEERING, ELECTRICITY AND SAFETY.
INSTRUCTOR
MANY COMPANIES EXPECT APPRENTICES TO BE HIGH SCHOOL GRADUATES BETWEEN 18 AND 26 YEARS OLD.
A MILLWRIGHT HAS VARIED, INTERESTING WORK, BUT IT IS USUALLY STRENUOUS AND OFTEN DANGEROUS. THEY MAY WORK INDOORS AND OUTDOORS OR IN GREAT HEAT AND EXTREME COLD AT TIMES!

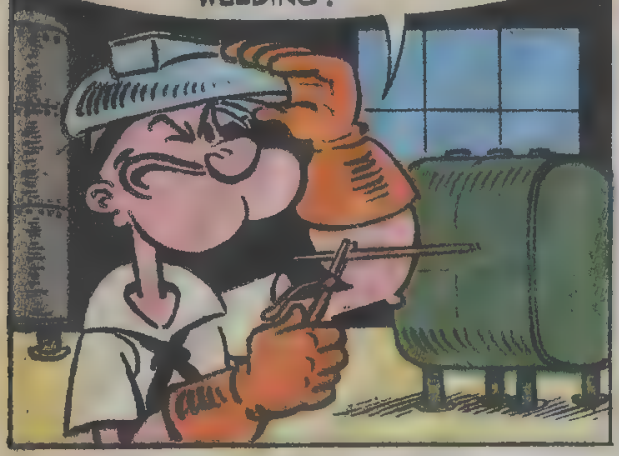

MILLWRIGHTS ARE IN DEMAND AND ARE SELDOM OUT OF WORK! THEY MAKE COMFORTABLE LIVINGS FOR THEIR FAMILIES AND MOST OF THEM LIKE THEIR WORK.


HERE IS METAL IN A LIQUID STATE BEING POURED INTO FORMS. THE SHAPES IT HARDENS INTO WILL BE USED IN THE MAKING OF AUTOMOBILE ENGINES.

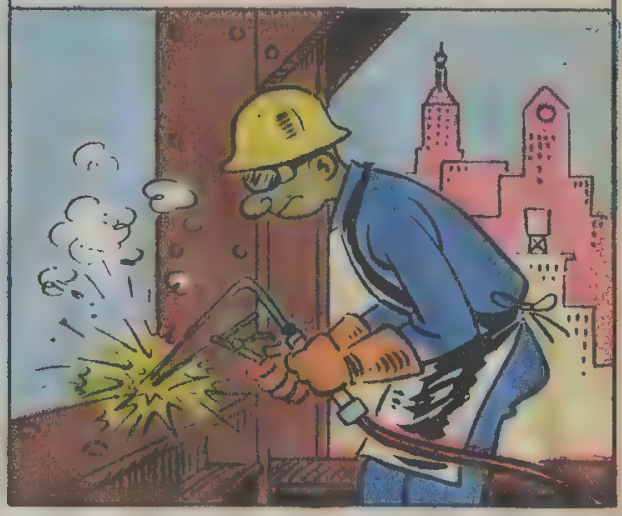
A PATTERNMAKER CONSTRUCTS A WOOD OR CLAY MODEL IN THE SHAPE OF THE FINAL CASTING — THIS IS A HIGHLY-SKILLED TRADE AND THE USUAL APPRENTICESHIP TRAINING IS REQUIRED.



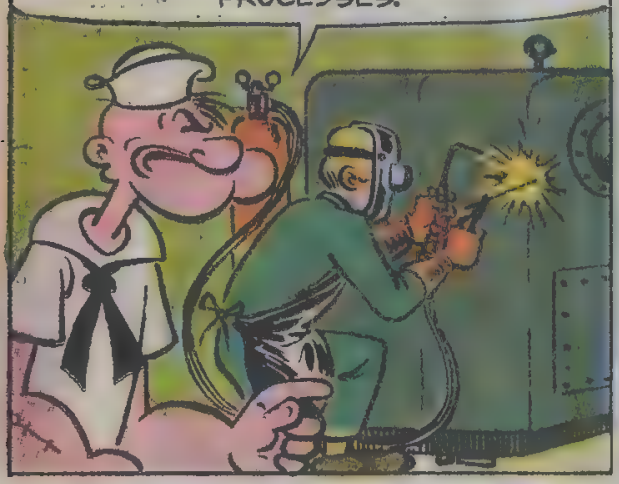
WELDING IS ONE OF THE MOST COMMON METHODS FOR JOINING METAL PARTS. MANY OF THE PARTS IN AUTOMOBILES, MISSILES, AIRPLANES AND THOUSANDS OF OTHER PRODUCTS ARE JOINED BY WELDING!



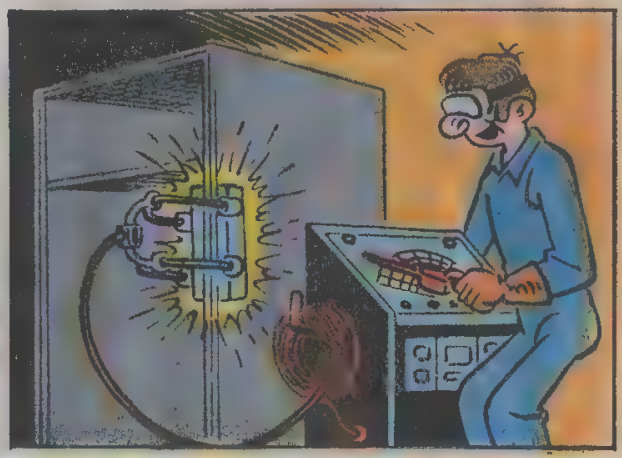
STEEL BEAMS ON SKYSCRAPERS, BRIDGES AND OTHER STRUCTURES ARE JOINED BY WELDING.



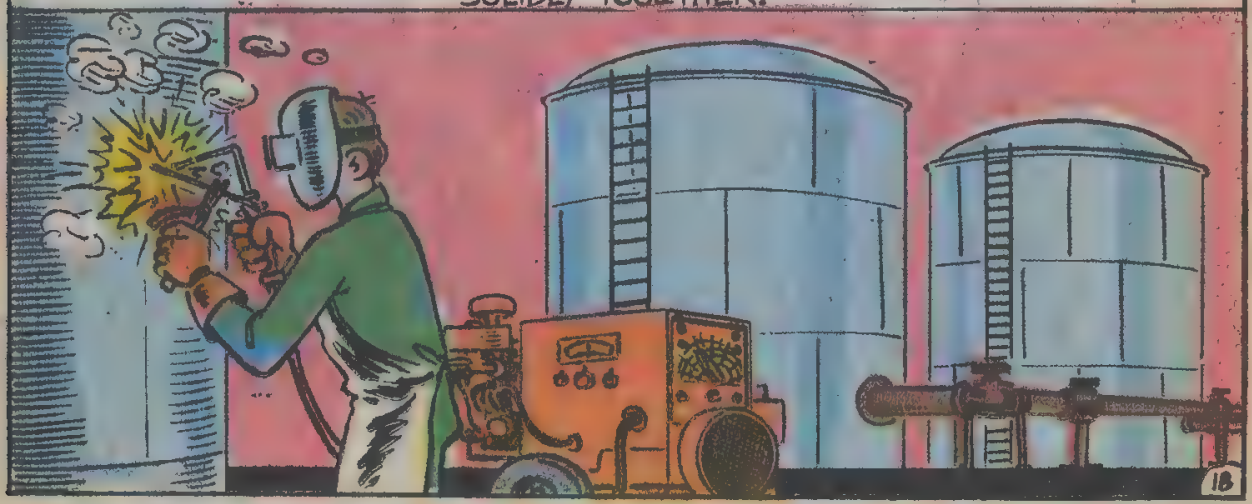
ARC, GAS AND RESISTANCE WELDING ARE THE THREE MOST OFTEN USED OF THE FORTY DIFFERENT WELDING PROCESSES.



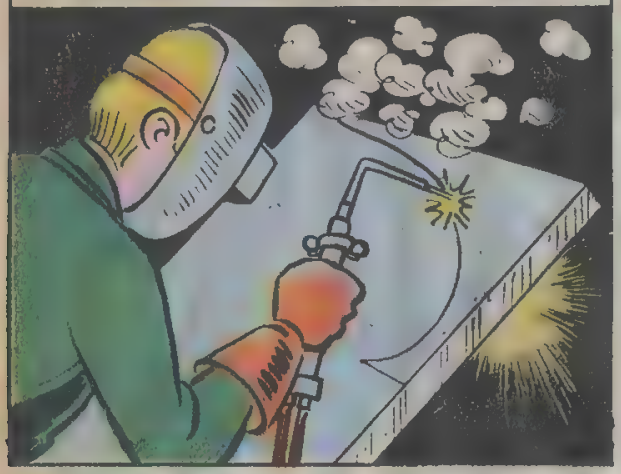
RESISTANCE WELDING IS USUALLY DONE BY MACHINE IN MANUFACTURING PROCESSES. THE RESISTANCE-WELDING OPERATOR FEEDS AND LINES UP THE WORK AND REMOVES IT AFTER THE WELDING IS COMPLETED.



THE ARC WELDER APPLIES A VERY HOT FLAME TO A METAL WIRE, MELTING IT AS IT TOUCHES THE METAL EDGES TO BE JOINED TOGETHER. THE WIRE AND THE METAL EDGES MELT TOGETHER AND WHEN THEY COOL, THEY ARE JOINED SOLIDLY TOGETHER.



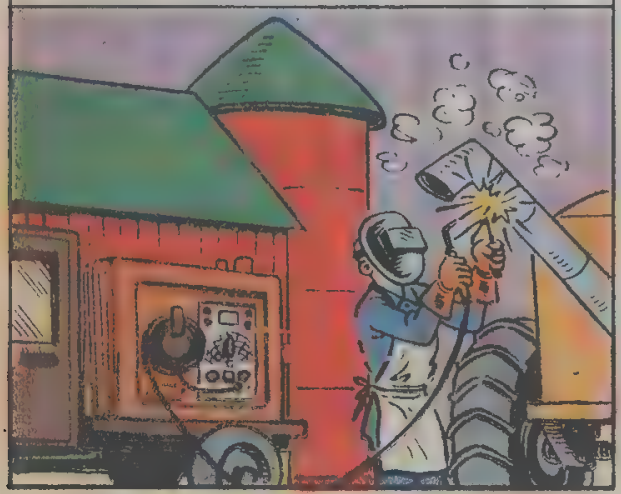
VERY SIMILAR TO WELDING IS OXYGEN AND ARC CUTTING. OXYGEN CUTTERS USE GAS AND OXYGEN FLAME TO HEAT METAL UNTIL IT BEGINS TO MELT, THEN USE ADDITIONAL OXYGEN WHICH CUTS THE METAL.



ARC CUTTERS PERFORM THE SAME WORK BUT THEY USE AN ELECTRICAL ARC TO MELT THE METAL BEFORE RELEASING A STREAM OF GAS TO CUT IT.

ABOUT 480,000 WELDERS AND CUTTERS ARE WORKING IN THIS COUNTRY. MANY OF THEM WORK IN TRANSPORTATION EQUIPMENT, MACHINERY, METAL PRODUCTS AND ELECTRICAL MACHINERY.

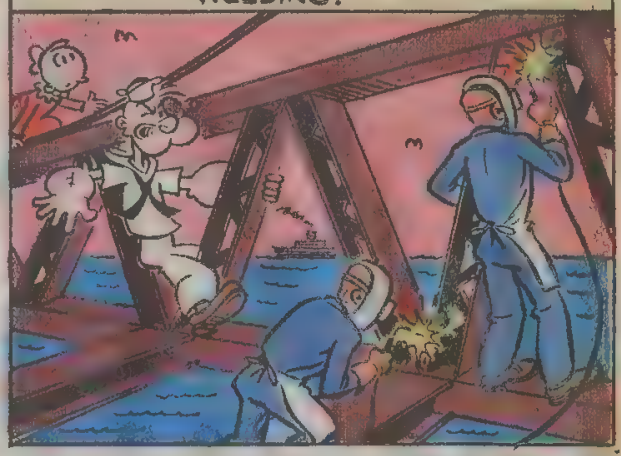
WELDERS FIND JOBS EVERYWHERE; IN RURAL AREAS AS WELL AS IN THE CITIES — THEY WORK FOR THE BIG MANUFACTURERS AND IN SMALL REPAIR SHOPS.

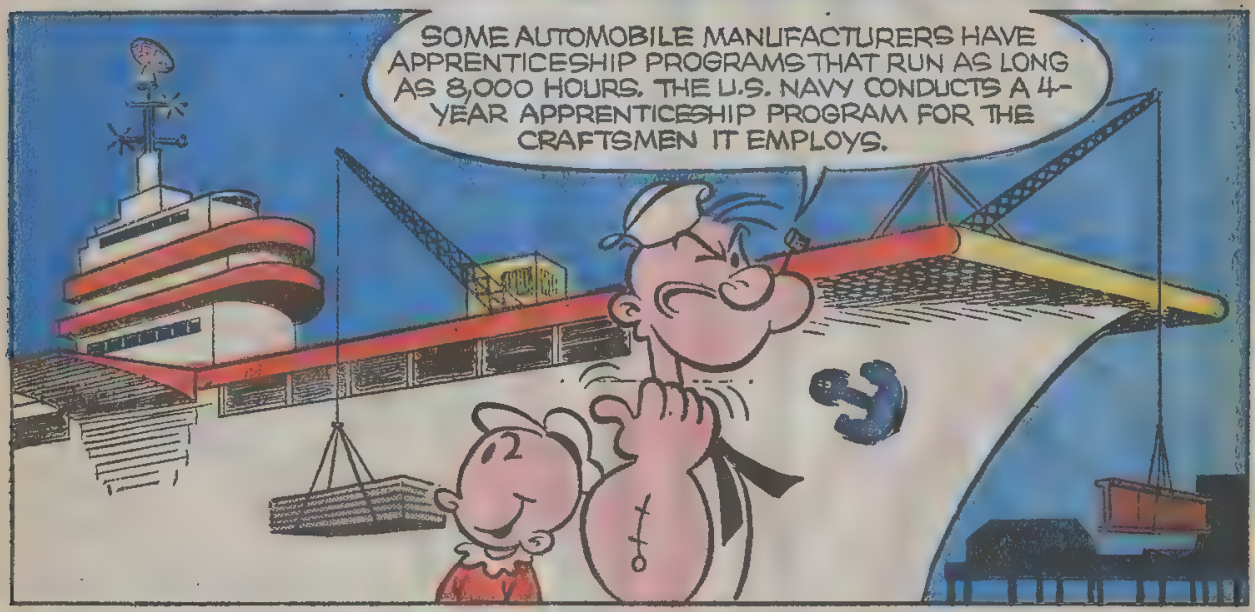


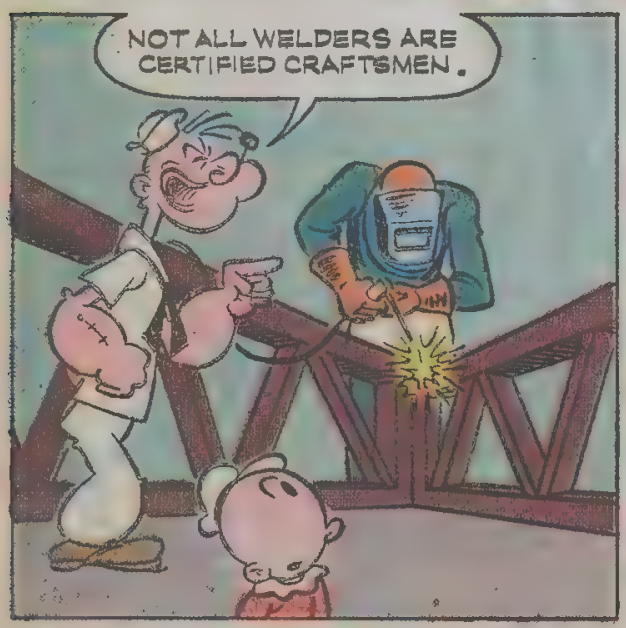
IT USUALLY TAKES SEVERAL YEARS OF TRAINING TO BECOME A SKILLED MANUAL ARC OR GAS WELDER. IT TAKES EVEN LONGER TO BECOME A COMBINATION WELDER, ABLE TO USE BOTH METHODS.

MANY JOBS NEED WORKERS SKILLED IN READING BLUEPRINT SPECIFICATIONS FOR WOOD, METAL AND ELECTRICAL WORK.

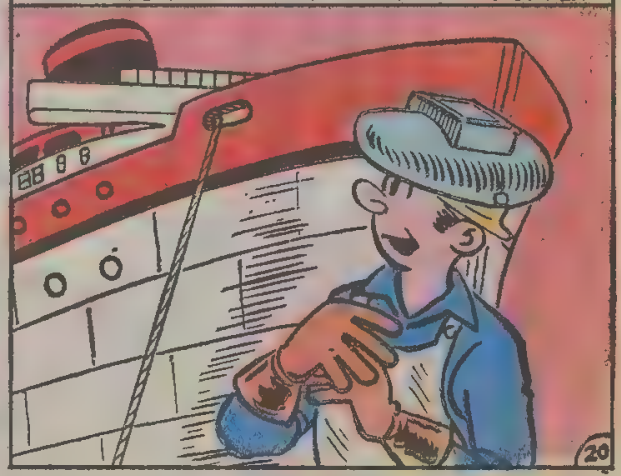
MOST EMPLOYERS PREFER APPRENTICES WHO CAN DO DIFFICULT WORK WITH THEIR HANDS AND WHO HAVE EXCELLENT EYESIGHT. THEY WANT YOUNG MEN WHO HAVE HAD HIGH SCHOOL OR VOCATIONAL TRAINING IN WELDING.




SOME AUTOMOBILE MANUFACTURERS HAVE APPRENTICESHIP PROGRAMS THAT RUN AS LONG AS 8,000 HOURS. THE U.S. NAVY CONDUCTS A 4-YEAR APPRENTICESHIP PROGRAM FOR THE CRAFTSMEN IT EMPLOYS.

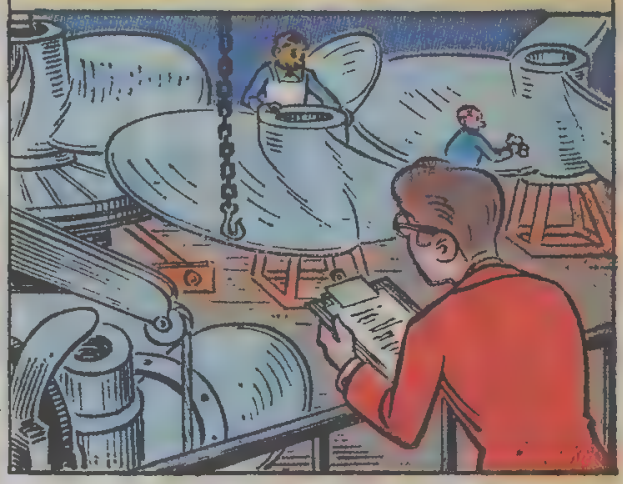


WELDERS MUST PASS AN EXAMINATION BEFORE THEY CAN WORK ON SOME JOBS. THEY MAY NEED TO HAVE A CRAFTSMAN'S CERTIFICATE TO WORK ON JOBS WHERE MISTAKES MAY CAUSE INJURY TO PEOPLE.

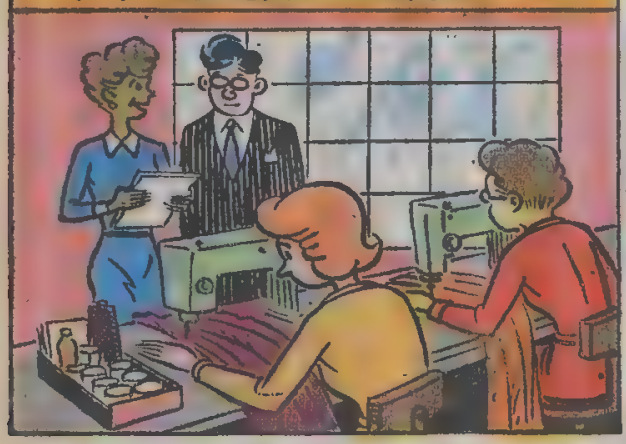


SAFETY ENGINEERS ARE EMPLOYED BY COMPANIES, THE GOVERNMENT AND INSURANCE COMPANIES. THEY CONSTANTLY PATROL WORK AREAS TO MAKE SURE THAT EVERYONE IS OBEYING THE SAFETY RULES.

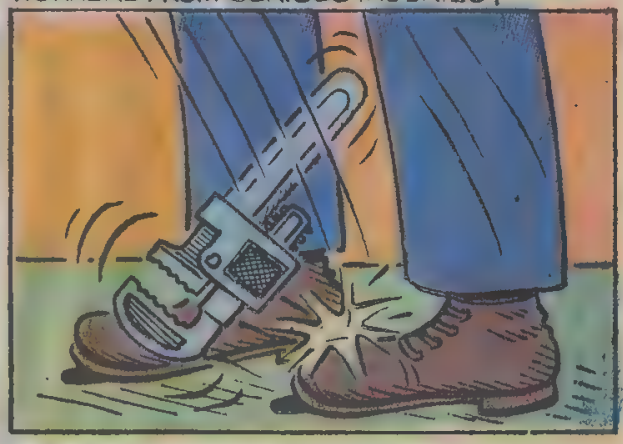
THEIR KNOWLEDGE OF HUMAN BEHAVIOR, INDUSTRIAL WORK AND HEALTH AND SAFETY LAWS HELPS THEM TO PROTECT WORKERS' LIFE AND HEALTH.



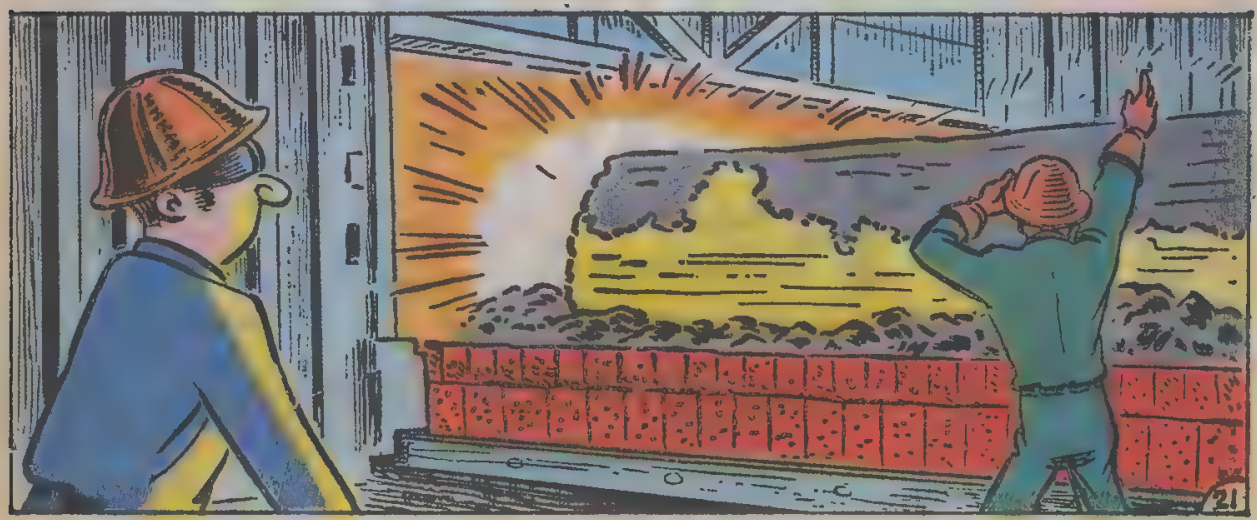
SAFETY ENGINEERS AND INSPECTORS TEST FOR POISONOUS OR EXPLOSIVE FUMES. THEY KNOW OF THE DANGERS IN WORK AREAS AND THEY GET EMPLOYERS TO FOLLOW SAFETY LAWS.



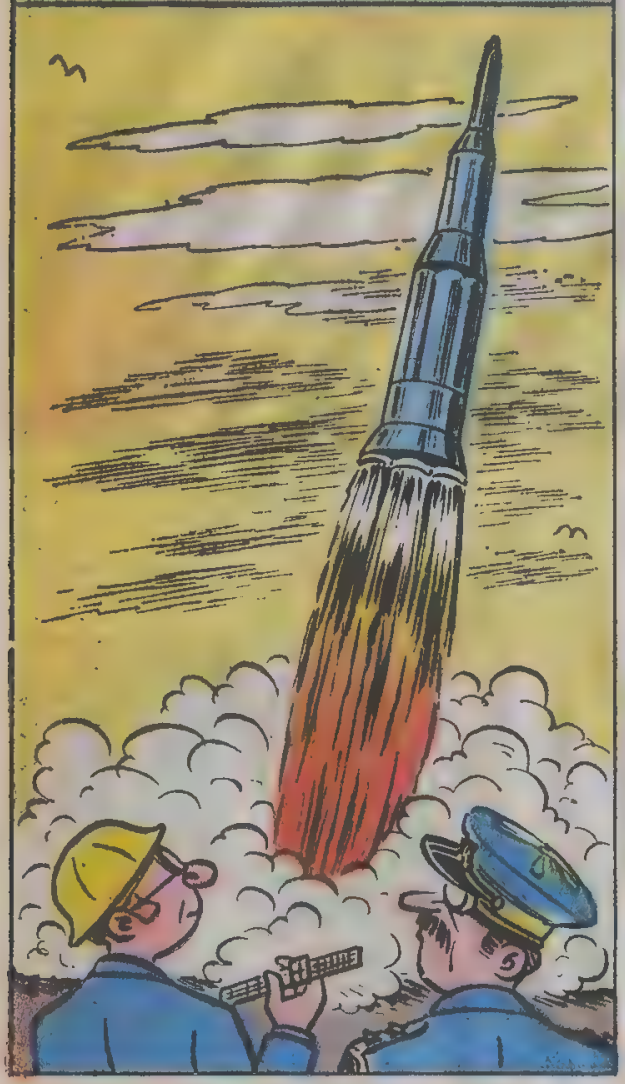
BECAUSE OF THE EFFORTS OF SAFETY ENGINEERS, HARD HATS ARE WORN WHERE NEEDED, SAFETY GLASSES ARE USED WHEN NECESSARY, AND SPECIALLY MADE SHOES WITH METAL TOES ARE WORN, PROTECTING WORKERS FROM SERIOUS INJURIES.



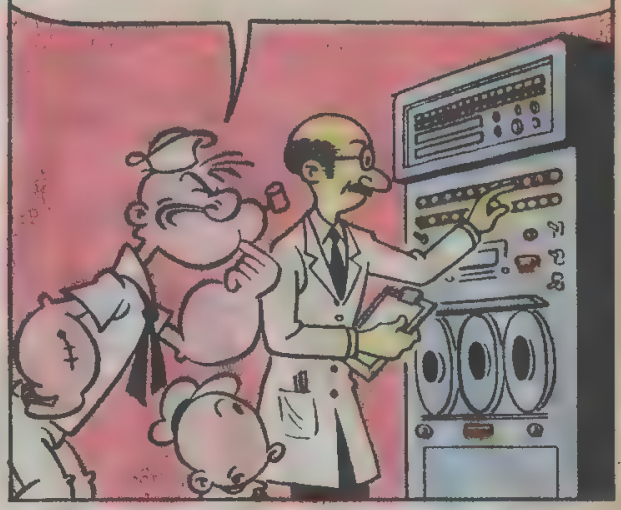
SOME SAFETY ENGINEERS GET JOBS AFTER THEY FINISH ON-THE-JOB TRAINING. OTHERS HAVE A COLLEGE DEGREE WITH A MAJOR IN ENGINEERING. STILL OTHERS FINISH COURSES IN SAFETY MANAGEMENT BEFORE BEGINNING WORK.



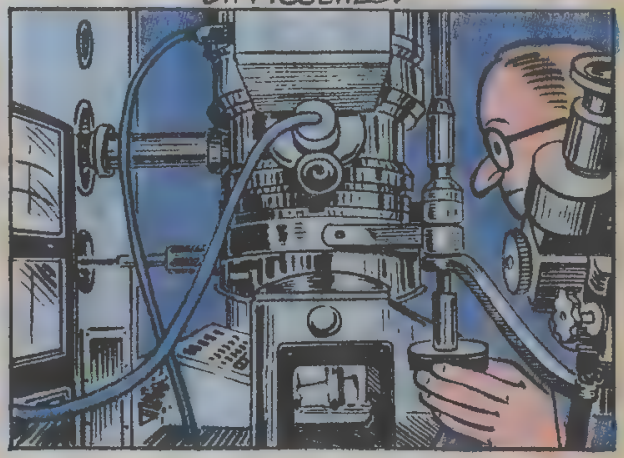
THE ASTRONAUTS' TRIPS TO THE MOON, THE EXPLORING OF THE OCEAN DEPTHS, AND EVEN THE SAFETY OF THE FAMILY CAR, ARE IN MANY WAYS THE RESULTS OF STUDIES MADE BY PHYSICISTS.

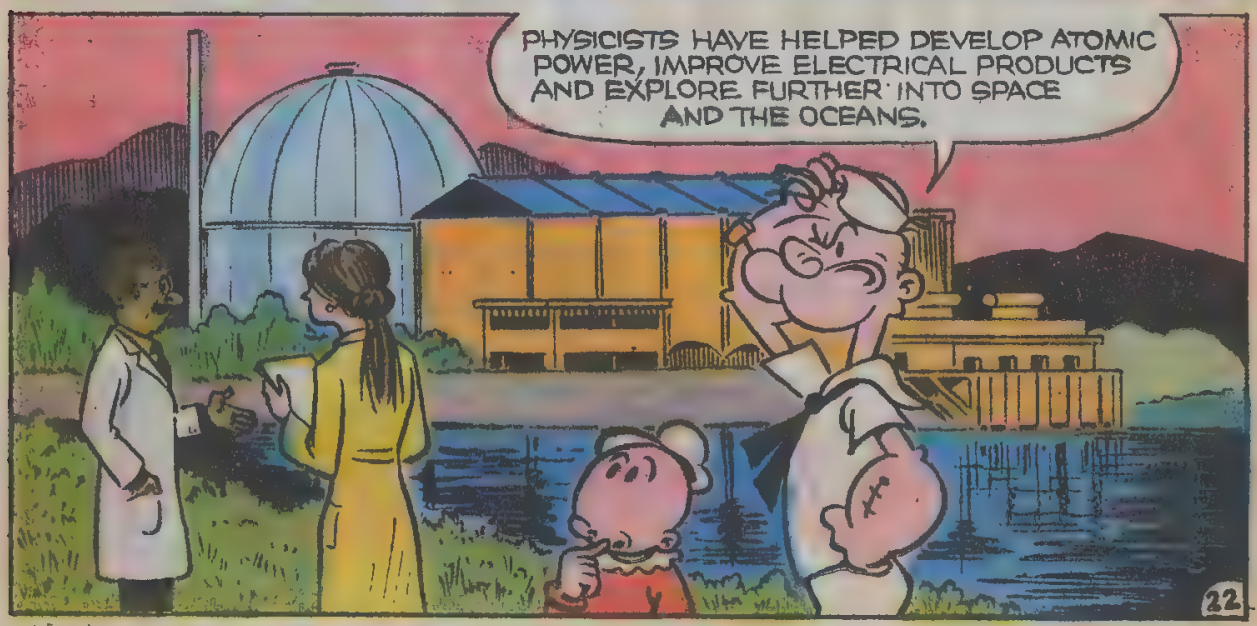


IN THEIR WORK PHYSICISTS USE MANY KINDS OF EXACT TESTING, MEASURING AND RECORDING EQUIPMENT.

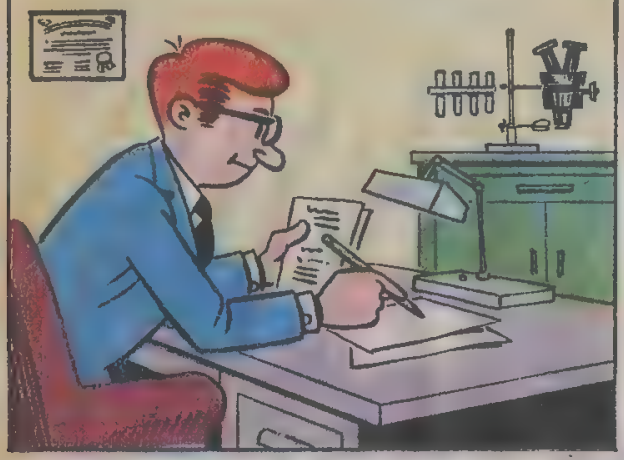


PHYSICISTS KEEP DISCOVERING MORE FACTS ABOUT GRAVITY, ELECTRICITY, MAGNETISM AND HEAT RADIO WAVES. THEIR FINDINGS HELP MANUFACTURERS TO BUILD BETTER PRODUCTS WITH FEWER DIFFICULTIES.

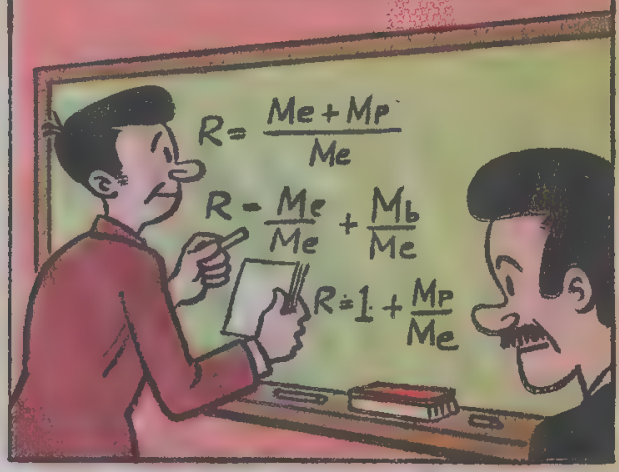


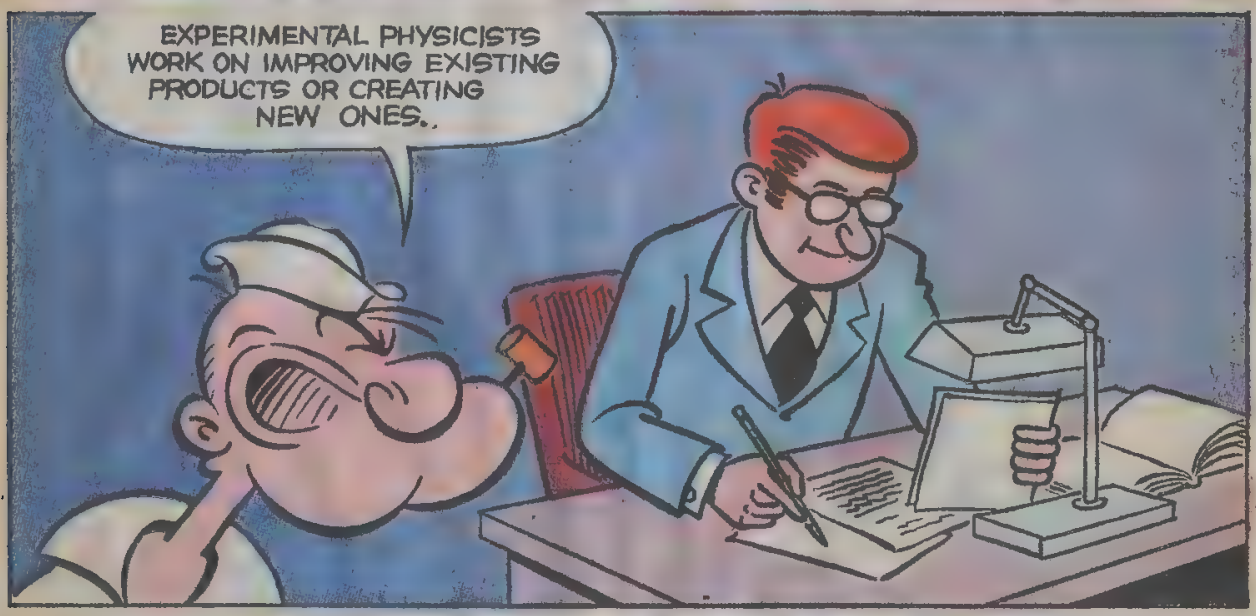

PHYSICISTS HAVE HELPED DEVELOP ATOMIC POWER, IMPROVE ELECTRICAL PRODUCTS AND EXPLORE FURTHER INTO SPACE AND THE OCEANS.

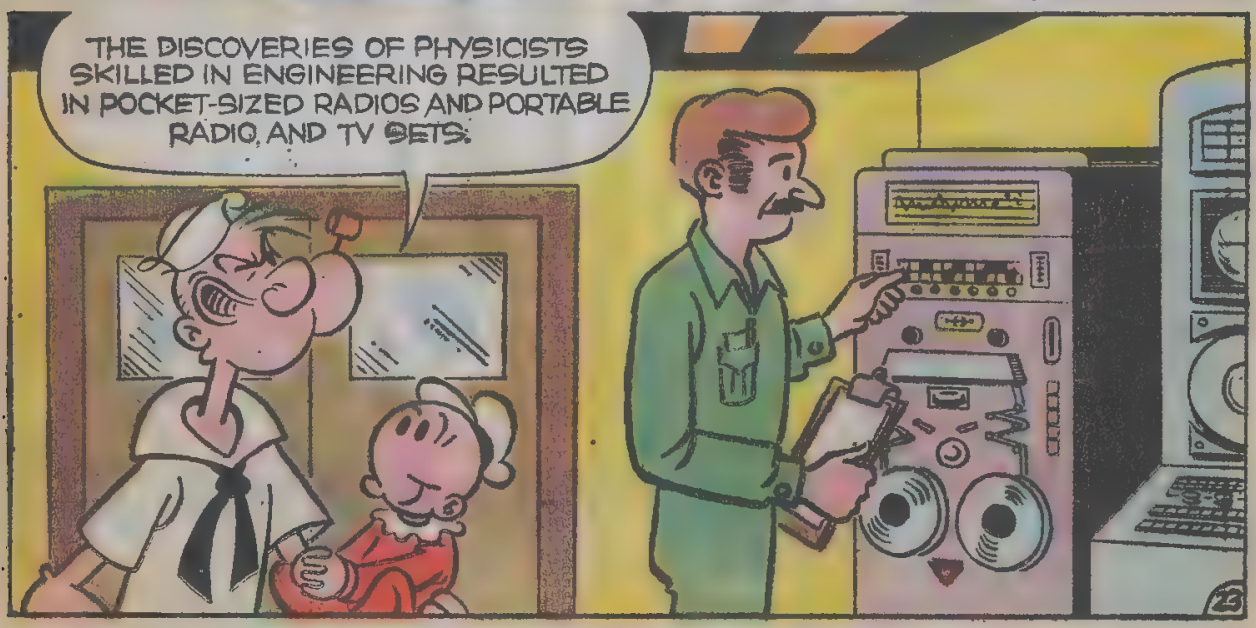
NEARLY THREE-FIFTHS OF ALL PHYSICISTS ARE ENGAGED IN RESEARCH AND DEVELOPMENT. THEY MAKE NEW DISCOVERIES IN SCIENCE WHICH HELP US TO UNDERSTAND HOW OUR WORLD WORKS!



PHYSICISTS THINK AND RECORD THEIR IDEAS IN MATHEMATICAL LANGUAGE. THEY MUST BE HIGHLY SKILLED IN EVERY TYPE OF MATHEMATICS.





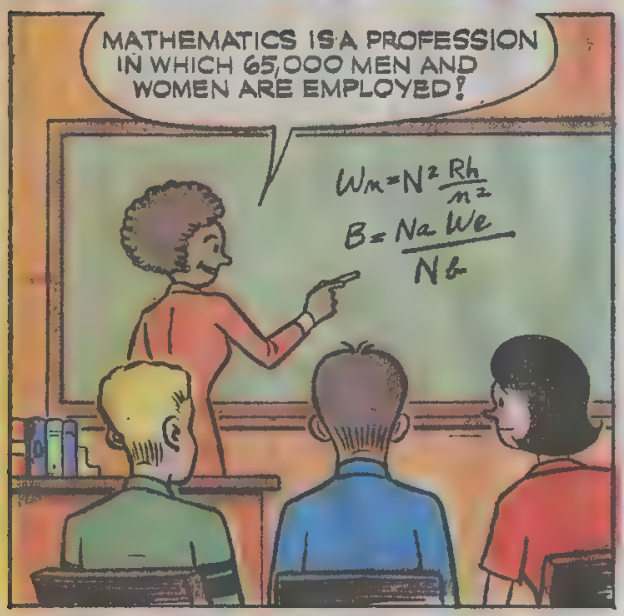


ABOUT ONE-FIFTH OF ALL PHYSICISTS TEACH IN COLLEGES AND UNIVERSITIES. OTHERS ARE IN MANAGEMENT AND ADMINISTRATION, ESPECIALLY IN RESEARCH AND DEVELOPMENT PROGRAMS.
MANY PHYSICISTS SPECIALIZE IN THE SCIENCES OF MOVING OBJECTS, HEAT, ENERGY, LIGHT, VISION AND SOUND.
A PHYSICIST MAY EVEN SPECIALIZE IN DISCOVERING THE BASIC COMPOSITION OF ALL MATTER. THESE DISCOVERIES HAVE APPLICATION IN MANY AREAS.
MANY PHYSICISTS APPLY THEIR THEORIES TO OTHER SCIENCES. A NUMBER OF NEW JOBS HAVE DEVELOPED SUCH AS LIFE PHYSICS, STAR PHYSICS AND EARTH PHYSICS.
ABOUT 45,000 MEN AND WOMEN PHYSICISTS WORK FULL TIME IN THIS COUNTRY. ABOUT 20,000 DO RESEARCH OR TEACH IN COLLEGES AND UNIVERSITIES. SOME DO BOTH.
UNIVERSITY

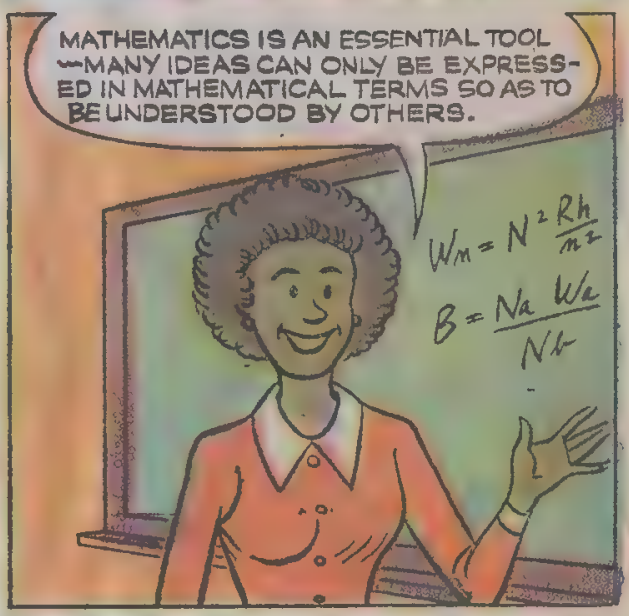
ONE BEGINS A PHYSICS CAREER BY GRADUATING COLLEGE WITH A MAJOR IN PHYSICS. MORE TRAINING IS NEEDED FOR MANY JOBS. A DOCTOR'S DEGREE IN PHYSICS IS NEEDED TO BE A FULL PROFESSOR IN A UNIVERSITY OR COLLEGE.

A MASTER'S DEGREE IN PHYSICS HELPS YOUNG PHYSICISTS GET A JOB IN INDUSTRIAL OR GOVERNMENT RESEARCH.

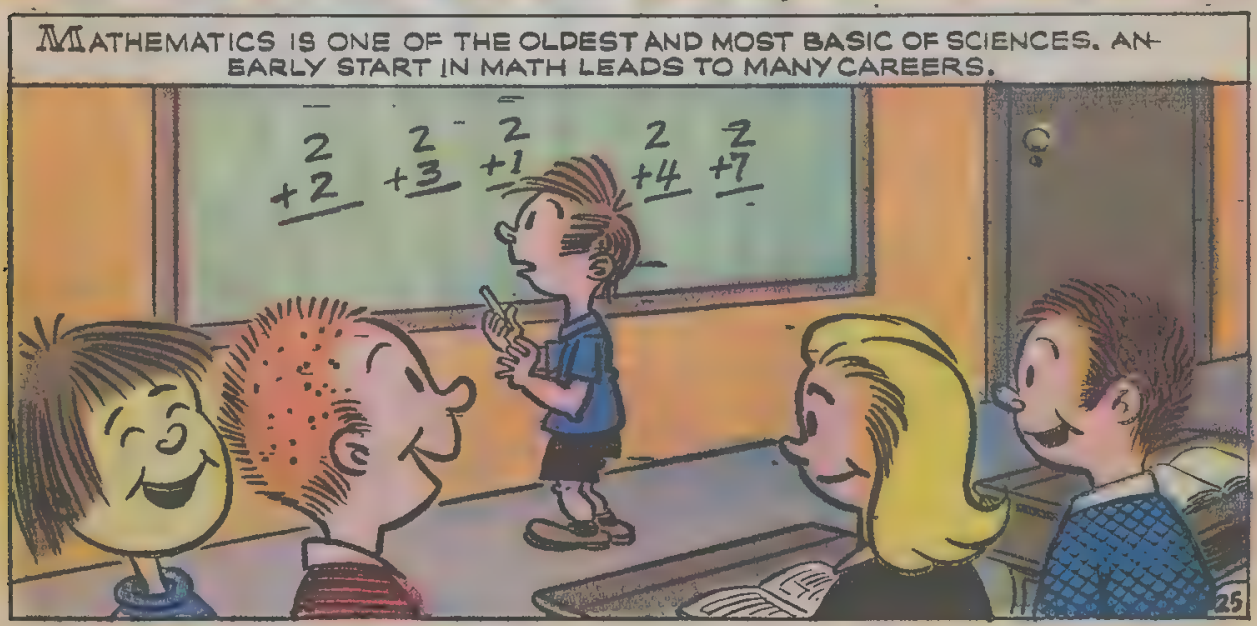
MATHEMATICS IS A PROFESSION IN WHICH 65,000 MEN AND WOMEN ARE EMPLOYED!



MATHEMATICS IS AN ESSENTIAL TOOL —MANY IDEAS CAN ONLY BE EXPRESSED IN MATHEMATICAL TERMS SO AS TO BE UNDERSTOOD BY OTHERS.



MATHEMATICS IS ONE OF THE OLDEST AND MOST BASIC OF SCIENCES. AN EARLY START IN MATH LEADS TO MANY CAREERS.

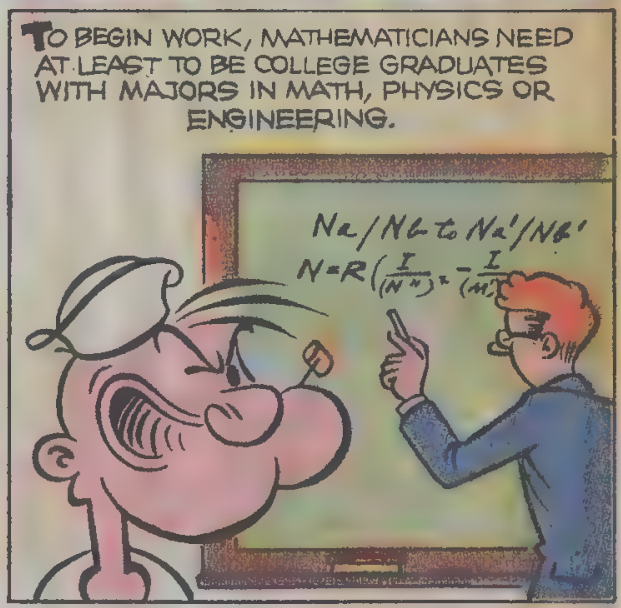


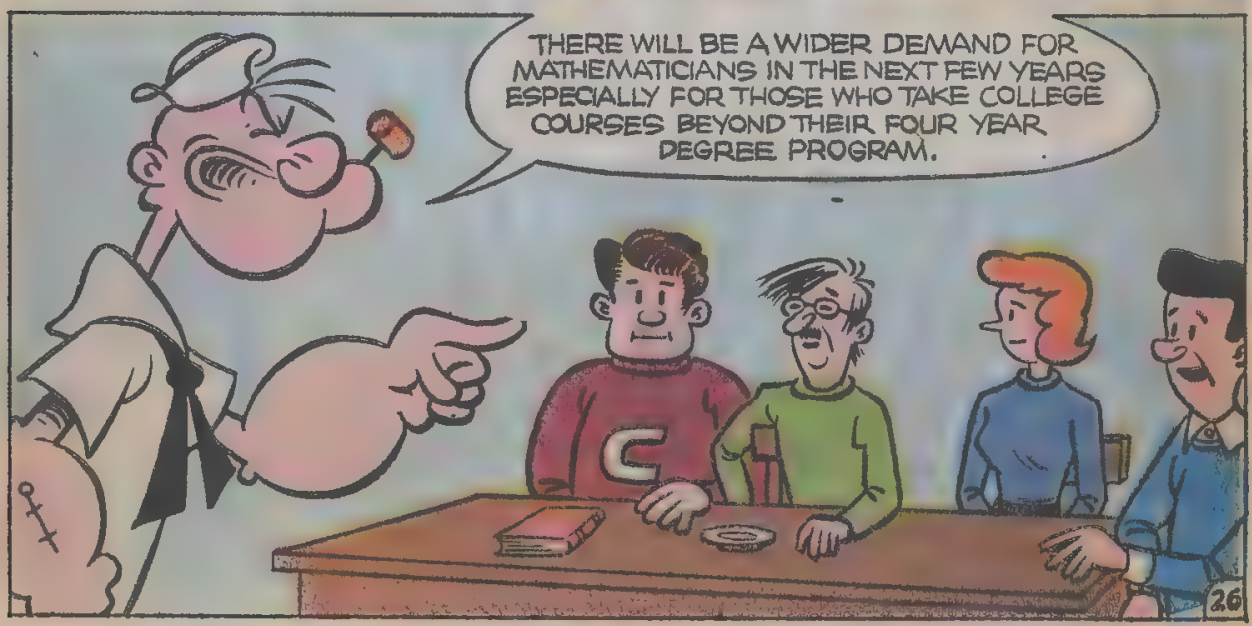
MORE THAN HALF OF THE 65,000 EMPLOYED MATHEMATICIANS WORK IN PRIVATE INDUSTRY — THEY ARE WITH AIRCRAFT MANUFACTURERS, FIRMS WHICH MAKE MACHINERY AND ELECTRICAL EQUIPMENT, AND COMPANIES INVOLVED IN OUR SPACE PROGRAMS.

SOME MATHEMATICS PROFESSIONALS ARE WITH PRIVATE CONSULTANT FIRMS.

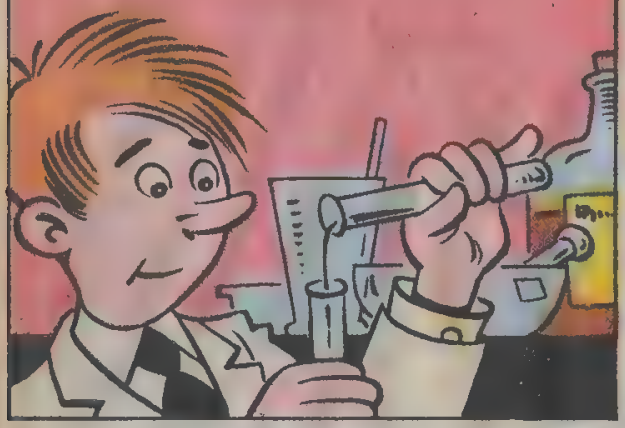
ABOUT ONE THIRD OF ALL MATHEMATICIANS ARE EMPLOYED AT COLLEGES AND UNIVERSITIES. ABOUT HALF OF THESE TEACH, THE REST ARE INVOLVED IN RESEARCH OR EXPERIMENTAL PROJECTS, MAKING NEW DISCOVERIES.

TO BEGIN WORK, MATHEMATICIANS NEED AT LEAST TO BE COLLEGE GRADUATES WITH MAJORS IN MATH, PHYSICS OR ENGINEERING.

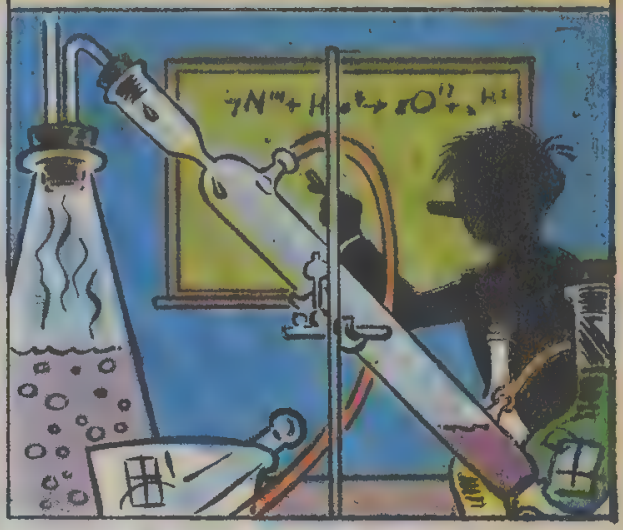



THERE WILL BE A WIDER DEMAND FOR MATHEMATICIANS IN THE NEXT FEW YEARS ESPECIALLY FOR THOSE WHO TAKE COLLEGE COURSES BEYOND THEIR FOUR YEAR DEGREE PROGRAM.

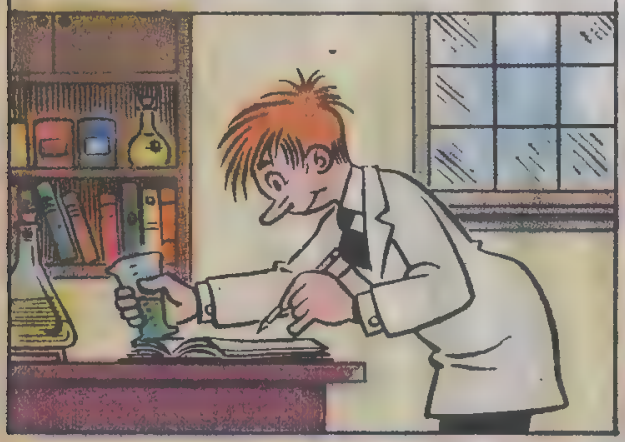
MOST OF THE CLOTHES WE WEAR, MUCH OF THE FOOD WE EAT AND THE FURNITURE AND HOUSES WE LIVE IN ARE THE PRODUCTS OF WORK THE CHEMISTS HAVE DONE!



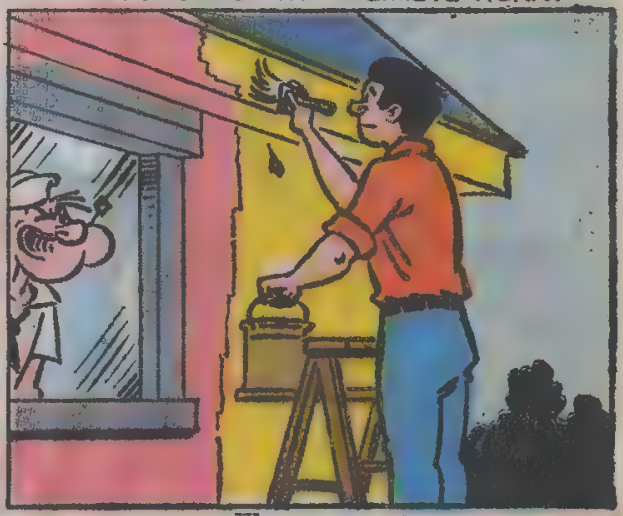
CHEMISTS SEARCH FOR NEW KNOWLEDGE ABOUT SUBSTANCES AND TRY TO PUT THIS KNOWLEDGE TO PRACTICAL USE.



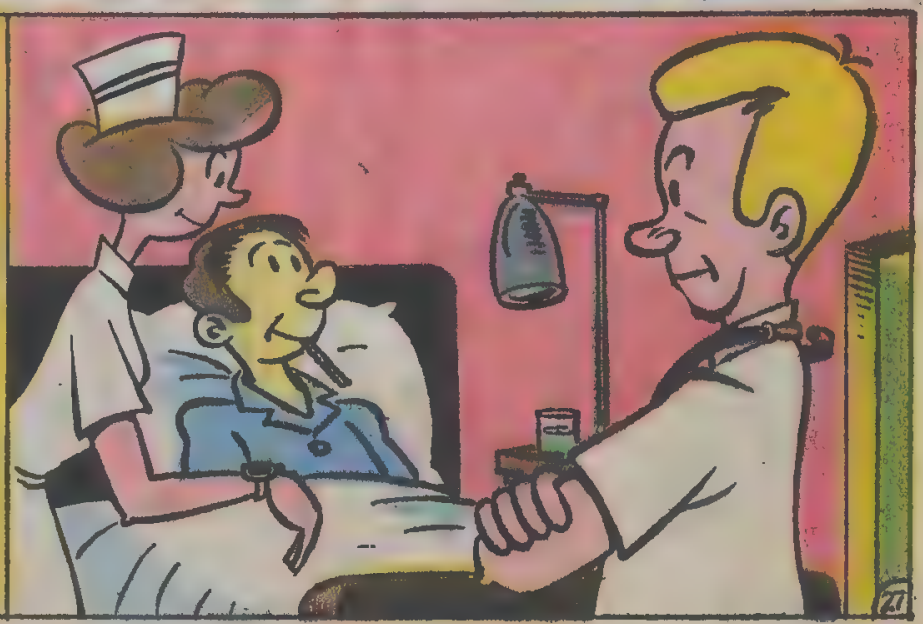
CHEMISTS RECORD THEIR WORK CAREFULLY AND PUBLISH THEIR FINDINGS IN SCIENTIFIC JOURNALS FOR OTHER SCIENTISTS TO READ AND USE.

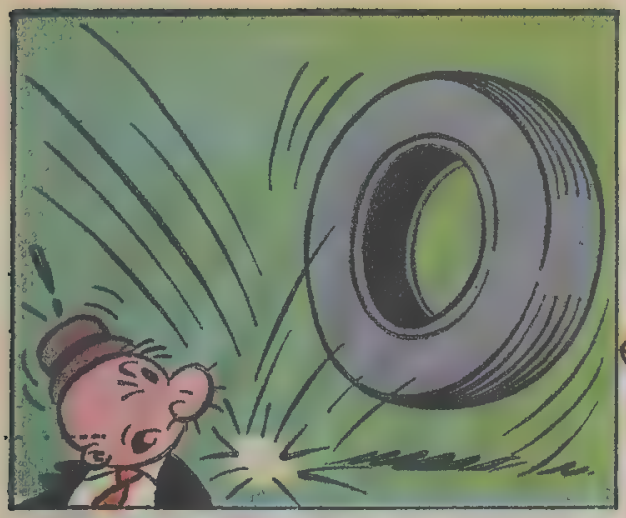


NEW, EASY-TO-APPLY PAINTS WHICH LAST FAR LONGER THAN PAINTS DID IN THE PAST ARE ONE RESULT OF THE CHEMISTS' WORK.

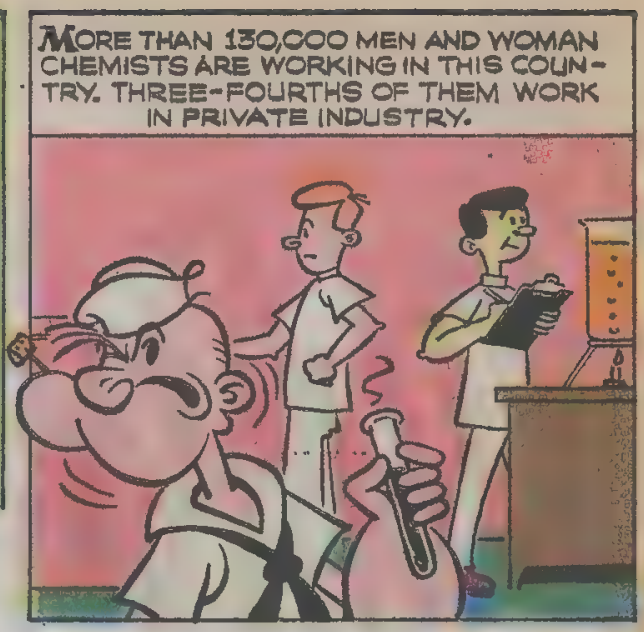


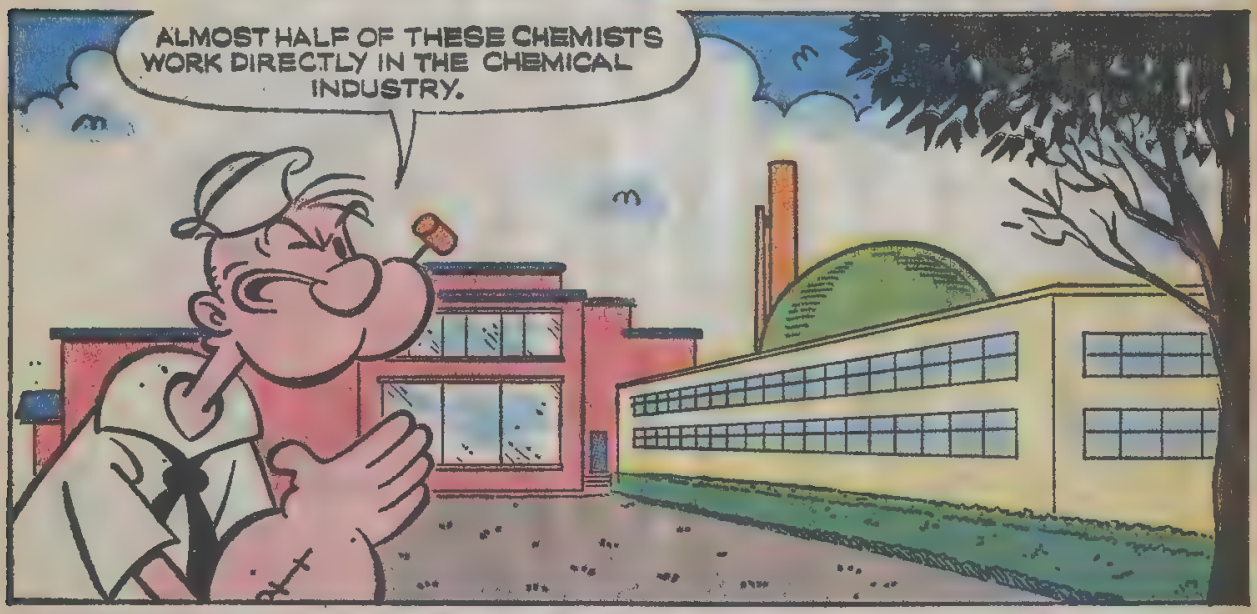
CHEMISTS HAVE HELPED DEVELOP MEDICINES, SAVING THE LIVES OF SICK PEOPLE WHO WOULD HAVE DIED IN OTHER DAYS — CHEMISTS HAVE DEVELOPED WAYS TO TREAT EVERY PROBLEM FROM PEELING PAINT TO SUNBURN LOTION.



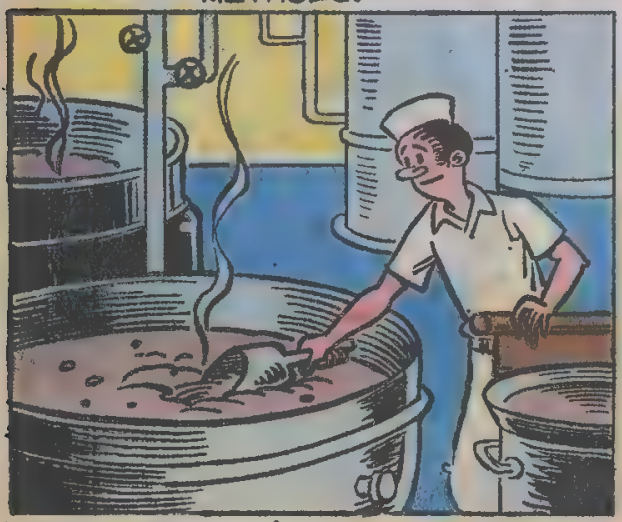


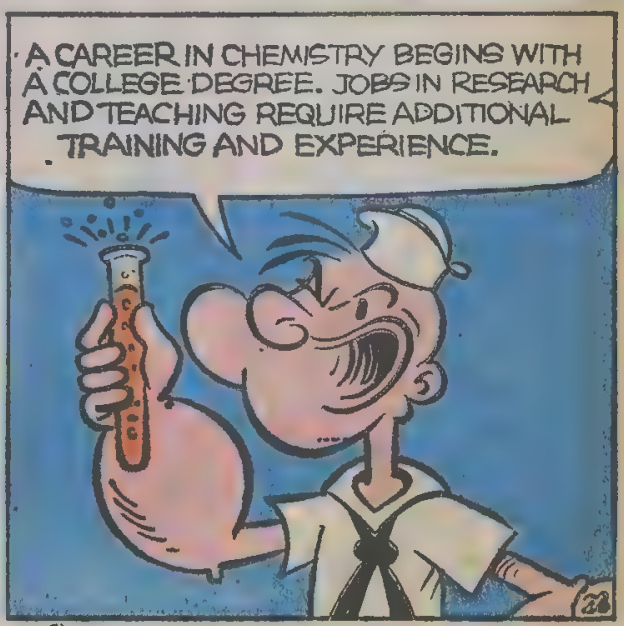
CHEMISTS HAVE DEVELOPED MANY SYNTHETIC MATERIALS SUCH AS ARE USED TO MAKE AUTOMOBILE TIRES, PLASTIC ITEMS, AND FIBERGLASS CURTAINS.



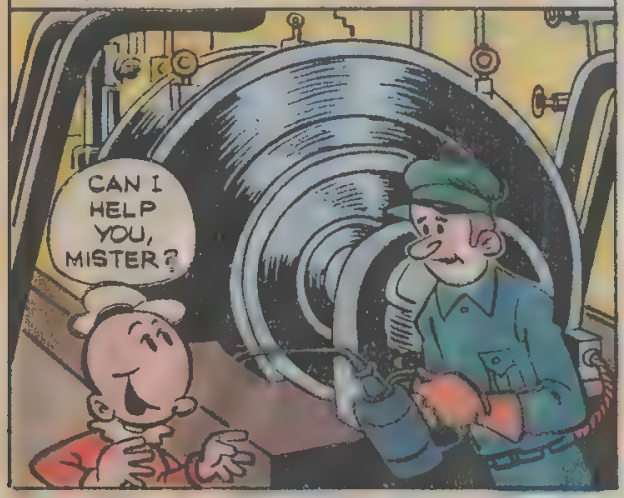


OTHER CHEMISTS WORK IN FOOD PROCESSING PLANTS, IMPROVING FOOD PREPARATION AND PACKAGING METHODS.

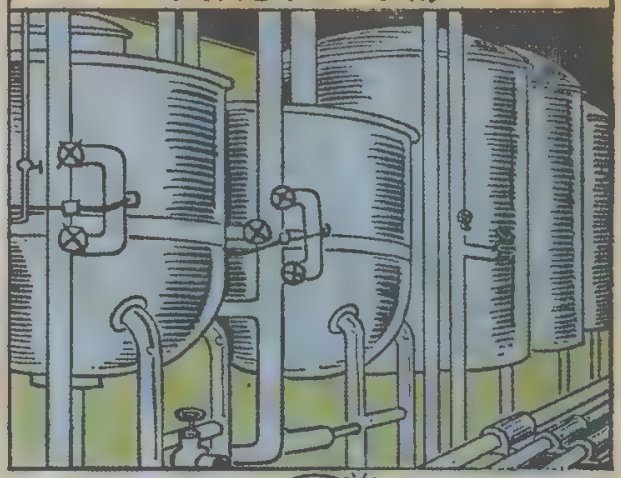


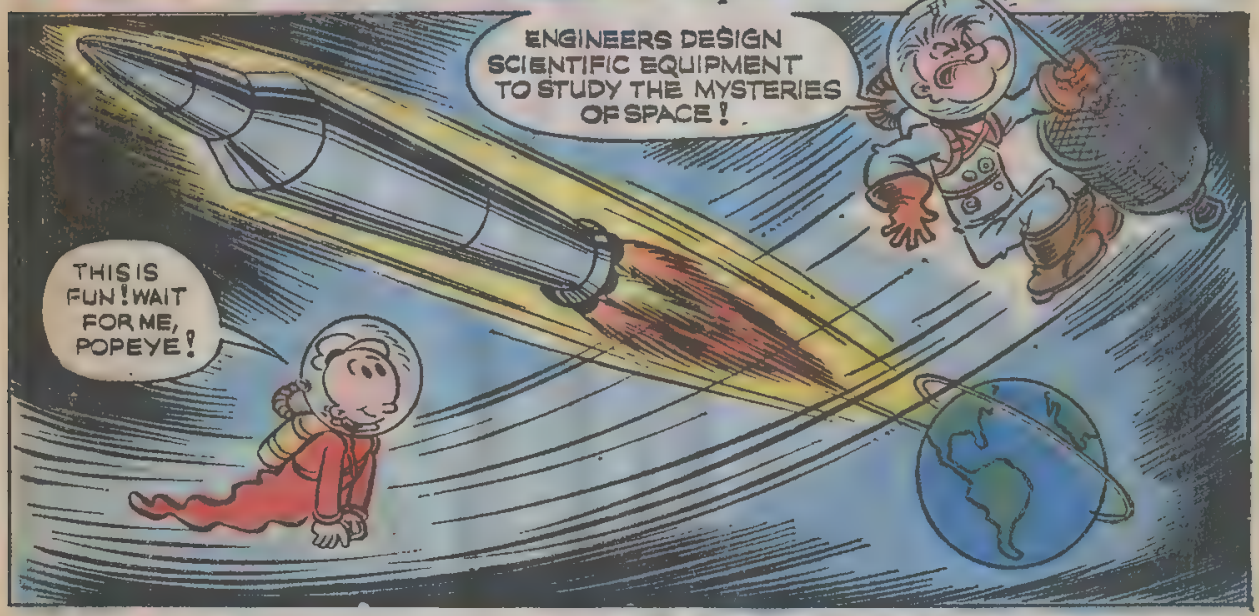

A CAREER IN CHEMISTRY BEGINS WITH A COLLEGE DEGREE. JOBS IN RESEARCH AND TEACHING REQUIRE ADDITIONAL TRAINING AND EXPERIENCE.

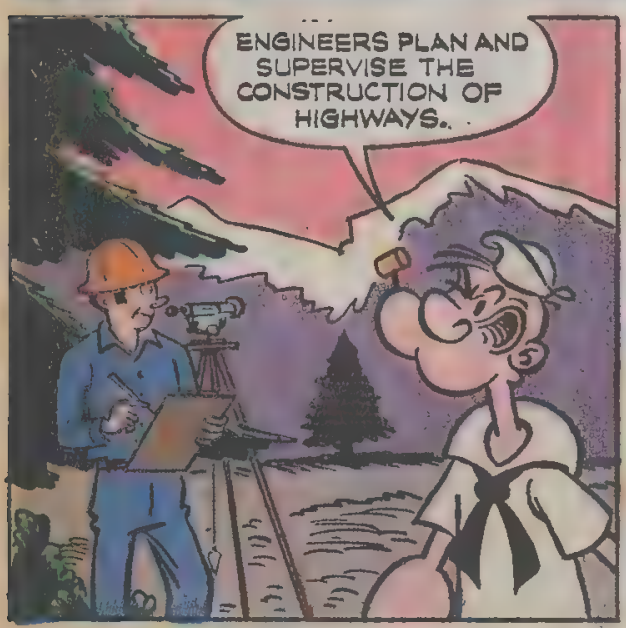
ENGINEERS CONTRIBUTE IN COUNTLESS WAYS TO OUR LIFE. THEY DEVELOP ELECTRIC EQUIPMENT; PLAN CLEAN WATER SUPPLY AND WASTE REMOVAL SYSTEMS.



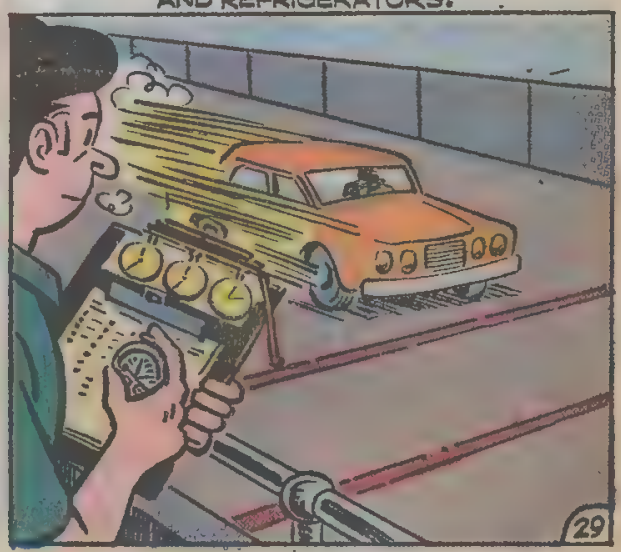
THEY DESIGN INDUSTRIAL MACHINERY AND EQUIPMENT FOR LARGE FACTORIES. THEY ALSO DEVELOP HEATING, AIR CONDITIONING AND VENTILATION EQUIPMENT FOR YOUR COMFORT.

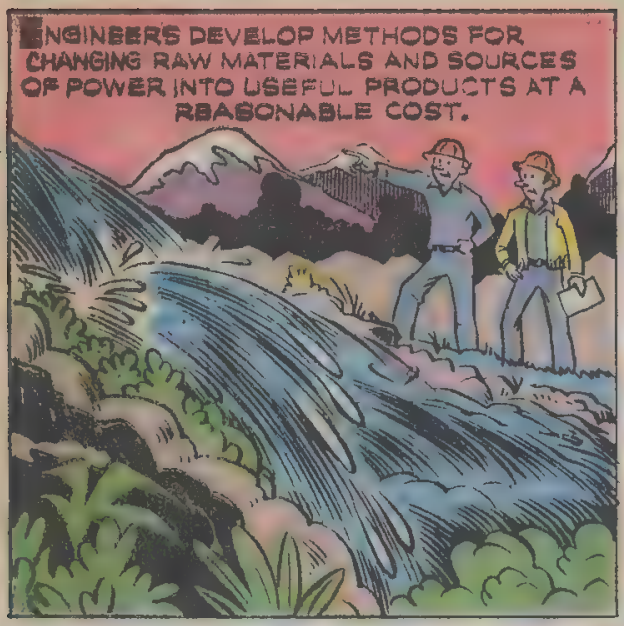


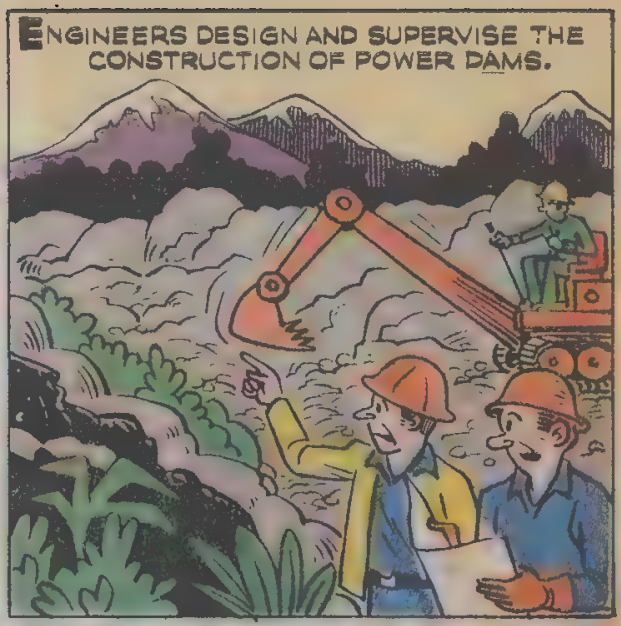


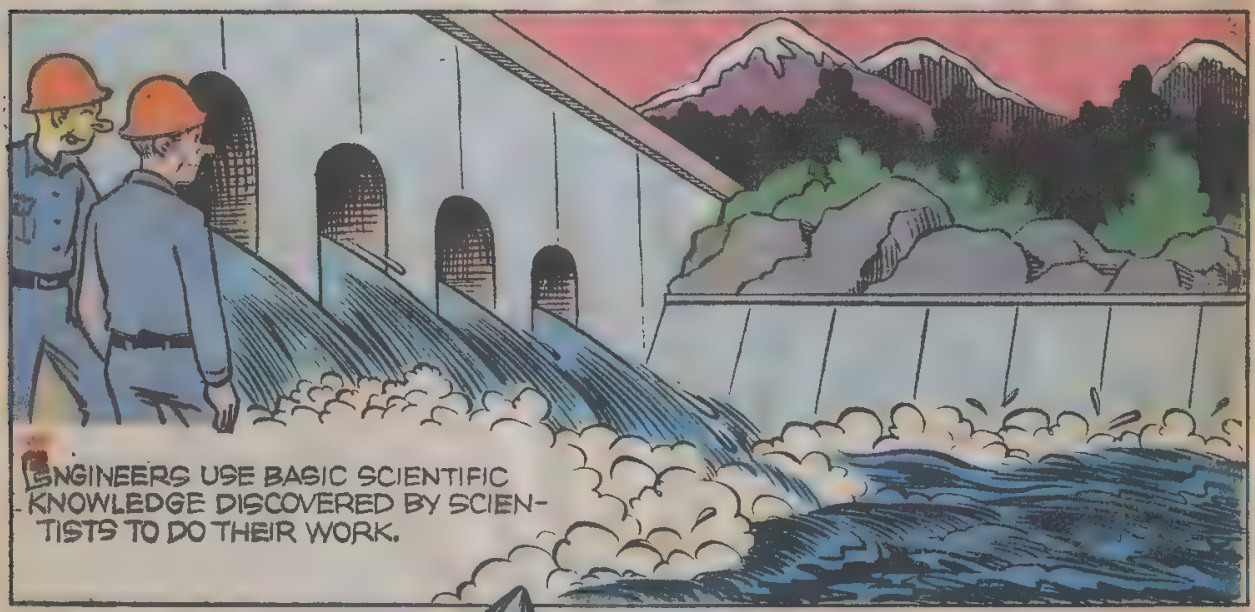


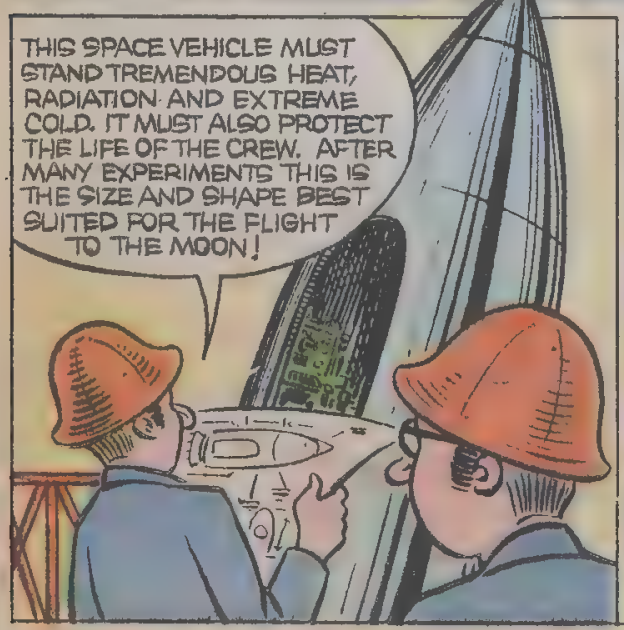
ENGINEERS DESIGN AND DEVELOP CONSUMER PRODUCTS SUCH AS AUTOMOBILES AND REFRIGERATORS.

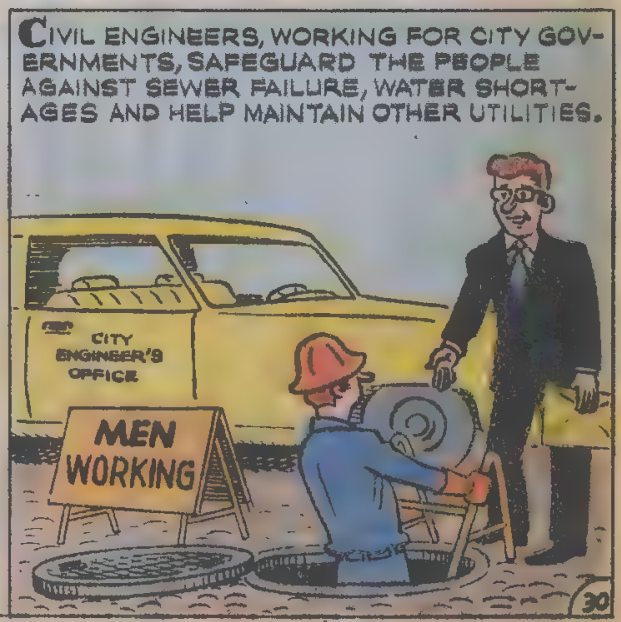


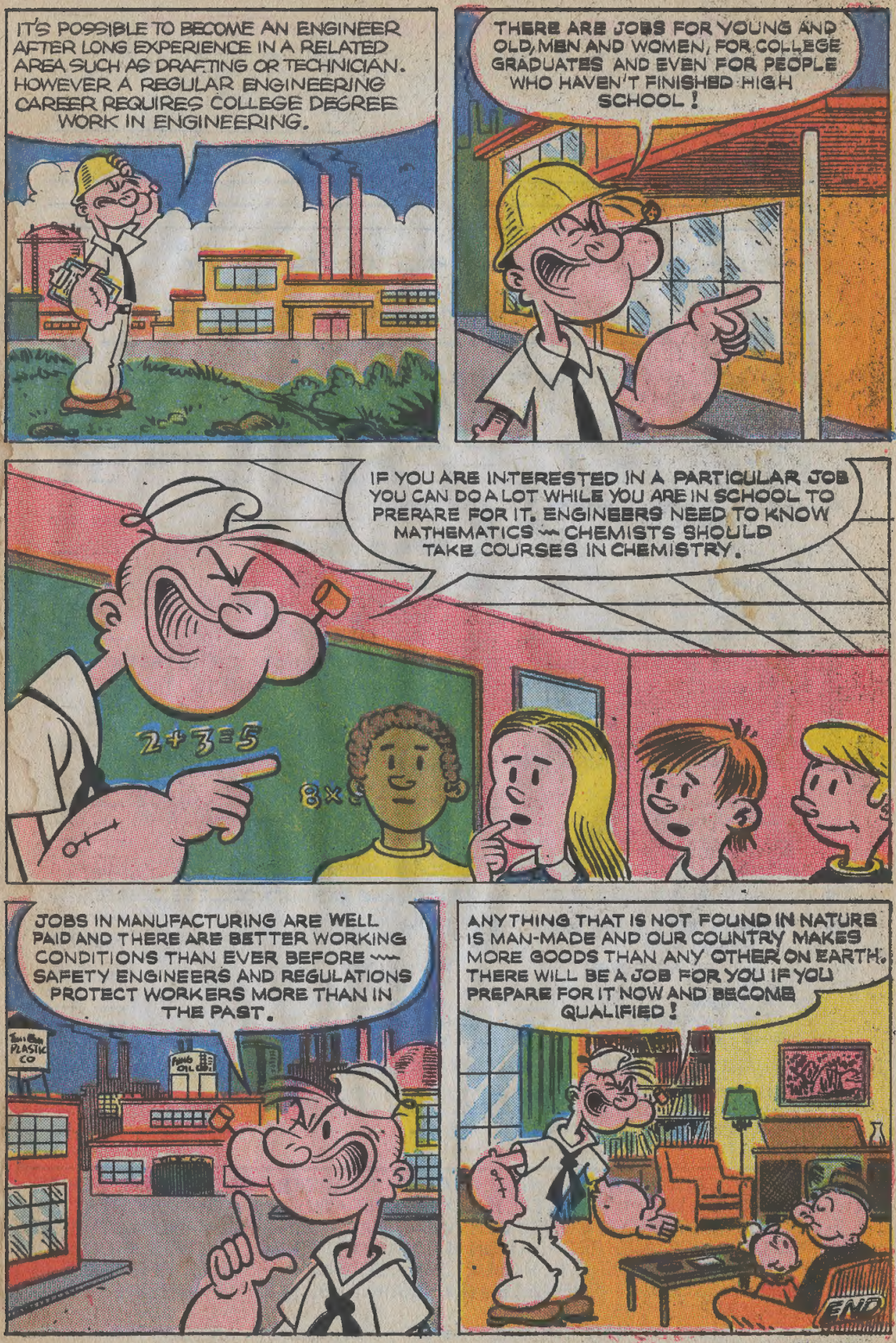

ENGINEERS DEVELOP METHODS FOR CHANGING RAW MATERIALS AND SOURCES OF POWER INTO USEFUL PRODUCTS AT A REASONABLE COST.


ENGINEERS DESIGN AND SUPERVISE THE CONSTRUCTION OF POWER DAMS.


ENGINEERS USE BASIC SCIENTIFIC KNOWLEDGE DISCOVERED BY SCIENTISTS TO DO THEIR WORK.


THIS SPACE VEHICLE MUST STAND TREMENDOUS HEAT, RADIATION AND EXTREME COLD. IT MUST ALSO PROTECT THE LIFE OF THE CREW. AFTER MANY EXPERIMENTS THIS IS THE SIZE AND SHAPE BEST SUITED FOR THE FLIGHT TO THE MOON!


CIVIL ENGINEERS, WORKING FOR CITY GOVERNMENTS, SAFEGUARD THE PEOPLE AGAINST SEWER FAILURE, WATER SHORTAGES AND HELP MAINTAIN OTHER UTILITIES.
CITY ENGINEER'S OFFICE
MEN WORKING


IT'S POSSIBLE TO BECOME AN ENGINEER AFTER LONG EXPERIENCE IN A RELATED AREA SUCH AS DRAFTING OR TECHNICIAN. HOWEVER A REGULAR ENGINEERING CAREER REQUIRES COLLEGE DEGREE WORK IN ENGINEERING.
THERE ARE JOBS FOR YOUNG AND OLD, MEN AND WOMEN, FOR COLLEGE GRADUATES AND EVEN FOR PEOPLE WHO HAVEN'T FINISHED HIGH SCHOOL!
IF YOU ARE INTERESTED IN A PARTICULAR JOB YOU CAN DO A LOT WHILE YOU ARE IN SCHOOL TO PREPARE FOR IT. ENGINEERS NEED TO KNOW MATHEMATICS — CHEMISTS SHOULD TAKE COURSES IN CHEMISTRY.
2+3=5
JOBS IN MANUFACTURING ARE WELL PAID AND THERE ARE BETTER WORKING CONDITIONS THAN EVER BEFORE — SAFETY ENGINEERS AND REGULATIONS PROTECT WORKERS MORE THAN IN THE PAST.
PLASTIC CO
ANYTHING THAT IS NOT FOUND IN NATURE IS MAN-MADE AND OUR COUNTRY MAKES MORE GOODS THAN ANY OTHER ON EARTH. THERE WILL BE A JOB FOR YOU IF YOU PREPARE FOR IT NOW AND BECOME QUALIFIED!
END

CAN YOU ANSWER THESE ?

1. LIST FIVE MANUFACTURING JOBS YOU MIGHT ENJOY. NEXT TO EACH, LIST ANY TRAINING YOU WOULD NEED. YOU CAN FIND THE ANSWERS IN THIS BOOK.

JOBS	TRAINING

2. DID YOU FIND ANY JOB YOU DID NOT KNOW ABOUT ? LIST SIX.

3 MANUFACTURING JOBS ARE POSSIBLE WITH TRAINING WHICH MAY INCLUDE:

CHECK ONE	YES	NO		YES	NO
HIGH SCHOOL DIPLOMA			APPRENTICESHIP TRAINING		
VOCATIONAL SCHOOL TRAINING			COLLEGE DEGREE		
JUNIOR COLLEGE DEGREE			GRADUATE SCHOOL DEGREE		
ON-THE-JOB TRAINING			NO HIGH SCHOOL DIPLOMA		

4. MANUFACTURING CAREERS MAY BE FOUND IN:

CHECK ONE	YES	NO		YES	NO
FACTORIES			FOUNDRY PLANTS		
OFFICES			ARMED SERVICES		
SHIP YARDS			INSURANCE COMPANIES		
MACHINE BUILDING			GOVERNMENT AGENCIES		
STEEL PLANTS			LABORATORIES		
HEAVY CONSTRUCTION			SPACE SCIENCE		

5. DO PEOPLE WORKING IN MANUFACTURING JOBS ALWAYS WORK DURING THE DAY ?
6. DO MANUFACTURING CAREERS SOMETIMES FORCE PEOPLE TO WORK IN EXTREME HEAT AND EXTREME COLD ? - - - - - - - - -
7. ARE THERE JOBS IN MANUFACTURING FOR MEN AND WOMEN WITH A WIDE RANGE OF ABILITY AND TRAINING ? - - - - - - - - -
8. JOBS IN MANUFACTURING MAY REQUIRE:

CHECK ONE	YES	NO		YES	NO
GOOD HEALTH			LIKE TO WORK WITH YOUR HANDS		
GOOD EYESIGHT			ABILITY TO READ BLUEPRINTS		
MECHANICAL APTITUDE			GOOD COORDINATION		
REPETITIVE WORK			BODY STRENGTH		
DEPENDABILITY			SOME MATHEMATICS SKILL		

9. IS IT POSSIBLE TO FIND WORK IN MANUFACTURING WITHOUT A COLLEGE DEGREE ?
10. ARE THERE JOBS IN MANUFACTURING FOR:

CHECK ONE	YES	NO		YES	NO
SEMISKILLED WORKERS			PHYSICISTS		
FOREMEN			TECHNICIANS		
CRAFTSMEN			ASSEMBLING		
SKILLED WORKERS			INSPECTION		
ENGINEERS			MACHINISTS		

11. MANUFACTURING IS THE LARGEST OF ALL MAJOR INDUSTRIES. - - - -
12. DOES POPEYE THINK IT IS IMPORTANT TO STAY IN SCHOOL AND PREPARE SO YOU WILL BE QUALIFIED IF YOU WANT TO WORK IN MANUFACTURING ? -

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HEY, KIDS-

DISCUSSION QUESTIONS!

DIRECTIONS:

CONSIDER AND DISCUSS THE FOLLOWING QUESTIONS

1. WHAT PROJECTS HAVE YOU EVER CREATED, PLANNED AND COMPLETED BY YOURSELF? WHAT PROJECT WOULD YOU LIKE TO ACCOMPLISH IF YOU HAD THE RESOURCES AND TIME TO DO IT?

2. WHAT MANUFACTURED ITEMS THAT YOU OWN IMPRESS YOU WITH THE CLEVERNESS OF THEIR DESIGN, THEIR CONSTRUCTION, OR SOME OTHER FEATURES?

3. WHICH AREA, PRODUCT, PROCESS OR OTHER ASPECT OF MANUFACTURING INTERESTS YOU MOST IN ITEMS OF A FUTURE CAREER?

4. WHAT ARE THE OCCUPATIONS OF THE MANUFACTURING INDUSTRY THAT YOU MIGHT LIKE TO DO?

KIDS, DO YOU KNOW THAT MOST BREADS, CAKES, COOKIES, WE EAT ARE MANUFACTURED FROM FLOUR....AND FLOUR IS MADE FROM GRAIN? WHEAT, RYE, BARLEY, CORN, RICE OR OATS — THESE PLANTS ARE SAID TO BE THE MOST IMPORTANT FOOD PLANTS IN THE WORLD!

ALMOST EVERYBODY EATS SOME KIND OF BREAD BUT TO MAKE BREAD WE HAVE TO START WITH THE GROWING OF WHEAT ON THE FARM — AND EVERYTHING BUT THE GROWING IS DONE BY MACHINERY. THE TRACTOR PLOWS AND DISK HARROWS PREPARE THE GROUND. FERTILIZERS AND SEEDS ARE PUT INTO THE SOIL THEN THE PLANT DOES THE WORK. HELPED BY THE SUN AND RAIN, IT MAKES FOOD FOR ITSELF AND GROWS. IN A FEW MONTHS THE GRAIN IS READY TO BE HARVESTED AND STORED IN GRAIN ELEVATORS AND READY TO BE MADE INTO FLOUR FOR BREAD AND CAKES.

BREAD MAKING HAS CHANGED LITTLE SINCE THE EGYPTIANS DISCOVERED THAT FERMENTATION WOULD MAKE A LIGHTER, FINER LOAF. THE GRAIN USED TO BE GROUND BETWEEN TWO STONES, THE DOUGH IS MIXED, ALLOWED TO RISE (FERMENT) AND THE LOAF IS BAKED IN AN OVEN. IN MODERN FLOUR MILLS, METAL ROLLERS GRIND THE GRAIN INTO FLOUR. IT IS CLEANED AND WASHED AND GROUND SEVERAL MORE TIMES, THEN SIFTED WHERE THE BRAN AND WHEAT GERM IS SEPARATED. AFTER THE FLOUR PASSES THROUGH THE FINEST SIEVES, IT IS READY TO BE WEIGHED, PACKED AND SHIPPED TO FACTORIES AND GROCERS.

IN EVERY MODERN BAKERY THERE ARE MACHINES TO MIX THE DOUGH, MACHINES TO WEIGH, KNEAD AND SHAPE IT, OVENS TO BAKE IT, AND MACHINES TO SLICE AND WRAP IT. IT TAKES MECHANICS TO MAINTAIN THE MACHINES, CHEMISTS TO BUY THE INGREDIENTS AND TO PREPARE THE DOUGH, BAKERS, PACKERS, AND MANY MORE SKILLED PEOPLE TO RUN THE FACTORY THAT MAKES THE LOAF OF BREAD YOU EAT EVERYDAY.

I LIKE MY SPINACH WITH BREAD 'CAUSE I'M POPEYE THE SAILOR MAN! ARF-ARF!
BREAD AND JAM ARE GREAT, TOO!
YES, BREAD MAKES MY HAMBURGERS TASTE SCRUMPTIOUS!
SPINACH
JAM